Panasonic

PROGRAMMABLE DISPLAY

GT Series
Technical Manual

GT Series Technical Manual
ARCT1F398E-5 07.11

http://www.mew.co.jp/ac/e/fasys/

Matsushita Electric Works, Ltd.

Safety Precautions

Observe the following notices to ensure personal safety or to prevent accidents.
To ensure that you use this product correctly, read this User's Manual thoroughly before use.
Make sure that you fully understand the product and information on safe.
This manual uses two safety flags to indicate different levels of danger.

WARNING

If critical situations that could lead to user's death or serious injury is assumed by mishandling of the product:

-Always take precautions to ensure the overall safety of your system, so that the whole system remains safe in the event of failure of this product or other external factor.
-DO NOT USE THE PROGRAMMABLE DISPLAY TO CONTROL SAFETY FEATURES OR OTHER CRITICAL OPERATIONS OF EQUIPMENT OR SYSTEMS. A COMMUNICATION ERROR (FOR ANY REASON) MIGHT PREVENT SUCH SAFETY FEATURES OR CRITICAL OPERATIONS FROM FUCTIONING PROPERLY.
-Do not use this product in areas with inflammable gas. It could lead to an explosion.
-Exposing this product to excessive heat or open flames could cause damage to the lithium battery or other electronic parts.
-Battery may explode if mistreated. Do not recharge, disassemble or dispose of fire.

CAUTION

If critical situations that could lead to user's injury or only property damage is assumed by mishandling of the product.

-To prevent abnormal exothermic heat or smoke generation, use this product at the values less than the maximum of the characteristics and performance that are assure in these specifications.
-Do not dismantle or remodel the product. It could lead to abnormal exothermic heat or smoke generation.
-Do not touch the terminal while turning on electricity. It could lead to an electric shock..
-Use the external devices to function the emergency stop and interlock circuit.
-Connect the wires or connectors securely.
The loose connection might cause abnormal exothermic heat or smoke generation
-Do not allow foreign matters such as liquid, flammable materials, metals to go into the inside of the product. It might cause exothermic heat or smoke generation.
-Do not undertake construction (such as connection and disconnection) while the power supply is on.
-The control force of the touch switches should be less than the specification of the product. Failure to do so could
lead to a damage to the product or a personal injury.
-These touch switches operate using analog resistance membrane. Do not press more than one point on the screen at a time. Doing so might operate a switch located in the middle of the points pressed if one exists, and could lead to a damage to the facility or an accident.
（The GT30 is not included）

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Record of changes

Before You Start

Usage conditions

When installing the product, make sure it is used within the range of the general specifications. Do not use in the following environments:

- Direct sunlight, wind and rain. (This product is not designed for outdoor use.)
- Ambient temperature outside the range of 0 to +50°C.
- (When installing the unit in a control panel, carefully consider radiation. Also, do not install the unit immediately above any devices generating heat.)
- Ambient humidity outside the range of 20% to 85% RH (at 25°C, non-condensing).
- Sudden temperature changes causing condensation.
- Inflammable or corrosive gas.
- Excessive airborne dust, metal particles or saline matter.
- Areas where substances such as organic solvents (thinner, benzin, alcohol), strong alkali substances (ammonia, caustic soda), grinding fluid or cutting oil may adhere to the unit or in those atmospheres.
- Direct vibration, shock or direct drop of water.
  (This unit is warranted by IP65 for panel mounting, however, this applies to initial values.)
- Influence from power transmission lines, high voltage equipment, power cables, power equipment, radio transmitters, or any other equipment that would generate high switching surges.
  Use the unit within the range of the general specifications when installing.
- For use in pollution Degree 2 environment

Power supply wiring

- For the power supply, use twisted wire (strand wire).
- There is sufficient noise resistance to offset power line noise, but we recommend reducing noise by measures such as installing an insulated transformer. If necessary, we recommend to take measures such as installing a ferrite core.
- Separate wiring systems should be used for the power supply and operating unit.

Static Electricity/Noise

- Keep the programmable display unit, PLC connecting cable and power wire as far as possible from machines that are likely to produce noise such as a welding machine, power line, inverter and motor. Especially for the control line communication cable, do not bundle it together with a power line or high-tension line, or do not wire it near those lines. Keep it clear of power lines and high-tension lines at least approx. 200 m. Failure to do so could lead to malfunction due to noise.
- For use in environments where the frequent occurrence of static electricity, radiation, or induced noise can be expected, the use of shielded cable on all wiring and grounding of shield (1-point ground) is recommended. When wiring the equipment, shielded wires should be electrically insulated to signal lines and signal grounds.
- If excessive static electricity is applied to the panel surface, the LCD display unit may be damaged.
- Before touching the main unit, always touch a grounded piece of metal in order to discharge static electricity.

Other precautions

- There is a case that shadows appear in the place on the screen of the GT where no graphic or part is arranged. (The shadows appear as the extension of the characters, graphics or parts actually being displayed.) This is a phenomenon resulting from the basic characteristics of liquid crystal devices, and called cross talk.
- Always operate the touch switch with fingers. As the touch switch may be damaged due to the excessive load or shock (caused when being operated with any tools), the touch switch should be operated within the specified control force. Also, if the touch switch is pressed like kneading, the electrode may be worn out exceptionally, and cause the malfunction. Operate with a single touch of the switch.

Battery

Do not leave the battery in the unit when it is not used. There is a possibility of leak if it is left being discharged.

Manuals to be Used

- The manuals to be used for GT series are common to all the models.

GT series Technical Manual ARCT1F398E
- It is this manual.

Terminal GTWIN Operational Guide Book ARCT1F357E
- It is an operating manual for the tool software to create screens of GT series. It is supplied with the tool software.

General-purpose Serial Communication Manual ARCT1F356E
- It is required when communication is carried out with devices you developped such as a board and PC.

Unit type	Technical Manual ARCT1F398E	GTWIN Operational Guide Book ARCT1F357E	General-purpose Serial Communication Manual ARCT1F356E
GT01	Used	Used	Used/Not used
GT11	Used	Used	Used/Not used
GT21	Used	Used	Used/Not used
GT30	Used	Used	Used/Not used
GT32	Used	Used	Used/Not used
GT05	Used	Used	Used/Not used

Key Point: - The PDF versions are provided at our website.
http://www.mew.co.jp/ac/e/fasys/ (User registration is required. Free of charge)

- Terminal GTWIN Operational Guid Book <ARCT1F357E> is provided with Screen creation tool software Terminal GTWIN.

Version of GT and Available Functions

Compliant versions for GT series

GT	Version of GTWIN
GT05 series	Ver.2.9 or later
GT32 series	Ver.2.8 or later
GT21 series	Ver.2.7 or later
GT11 series	Ver.2.6 or later
GT01 series	Ver.2.3 or later
GT30 series	Ver.2.0 or later

Available functions for each version of GT and GTWIN

	GT Version	Display panel sideways setting	Line graph	Alarm list and alarm history	Recipe	Password	Flow display	Write device	Data parts: Floating-point scaling	Multi language exchange	Copy function	GTWIN version
GT01	Ver.1.0 or later	N/A	A	N/A	A	A	A	A	A	N/A	N/A	Ver.2.30 or later
	Ver.1.1 or later	A	A	N/A	A	A	A	A	A	N/A	N/A	Ver.2.40 or later
	Ver.1.2 or later	A	A	N/A	A	A	A	A	A	A	N/A	Ver.2.50 or later
	Ver.1.3 or later	A	A	N/A	A	A	A	A	A	A	A	Ver.2.71 or later
GT05	Ver.1.0 or later	N/A	A	A	A	A	A	A	A	A	N/A	Ver.2.90 or later
GT11	Ver.1.0 or later	A	A	A	A	A	A	A	A	A	N/A	Ver.2.60 or alter
	Ver.1.2 or later	A	A	A	A	A	A	A	A	A	A	Ver.2.71 or later
GT21	Ver.1.0 or later	N/A	A	A	A	A	A	A	A	A	N/A	Ver.2.70 or later
	Ver.1.1 or later	A	A	A	A	A	A	A	A	A	A	Ver.2.71 or later
GT30	Ver.2.0 or later	N/A	A	A	A	A	A	A	A	N/A	N/A	Ver.2.20 or later
GT32	Ver.1.0 or later	N/A	A	A	A	A	A	A	A	A	N/A	Ver.2.80 or later

A: Available N/A: Not available

The latest version of GT can be installed by the tool.

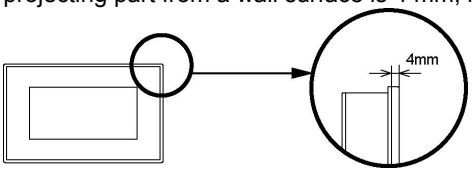
Reference: How to upgrade the version, <GTWIN Operational Guide Book ARCT1F357E>

Chapter 1

Features and Functions

1.1 Features and Functions of GT Series

Can be installed in a small space.
As the GT series is a small and thin-shaped body, it can be installed in a small space. Also, as the projecting part from a wall surface is 4 mm, it looks neat after installation.



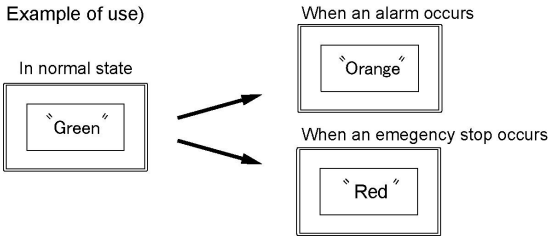
The GT01, GT11 and GT21 can be installed in vertical orientation.

Number of colors can be selected as usage.

GT series	Number of colors
GT21C	256 colors
GT30C	16 colors
GT32T0/GT32T1/GT05S	4096 colors

Easily shows a current state easily by changing the backlight on the monochrome type.
For the monochrome type (3-color LED backlight type), changing in the backlight color makes it easy to grasp a current state at a glance.

GT series	Backlight colors
GT01/GT05G/GT11	Green, orange, red
GT01R/GT05M	White, red, pink



Analog touch panel provided (GT01, GT11, GT21 GT32 and GT05)
As an analog touch panel is provided, it allows maximum flexibility in the switch layout and size.

Screens can be created easily, using a special screen creation tool Terminal GTWIN.
Screen contents can be easily created using the dedicated Terminal GTWIN tool. Screens are put together simply by selecting parts from libraries and positioning them in place.
Various parts for numerous applications are provided such as 256-color 3D parts.

Screen data of the other models can be used with the model conversion function.
Screen data can be converted from the GT with a small-sized screen to the GT with a large-sized screen, e.g. from GT01 to GT11, from GT21 to GT32.

The communication methods support RS232C/RS422 (RS485)
The communication methods to PLCs support RS232C/RS422(RS485). Also it can be connected to PLCs manufactured by other companies. For the communication with PLCs, a TOOL port (RS232C) is provided for GT01, GT11, GT21 and GT30, and USB or Ethernet (for GT32T1 only) is provided for GT05 and GT32.

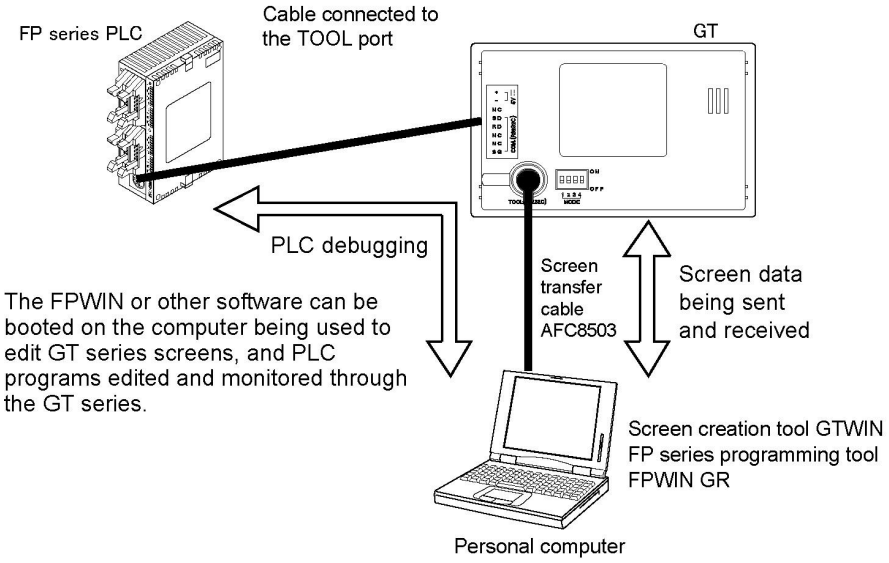
Structure adapted to surrounding environments
IP65. It has a dust-proof, waterproof and drop-proof structure.

High-intensity LED provided (GT01, GT05, GT11 and GT21)
As the high-intensity LED is provided, the screen is bright, and the backlight does not need to be replaced.

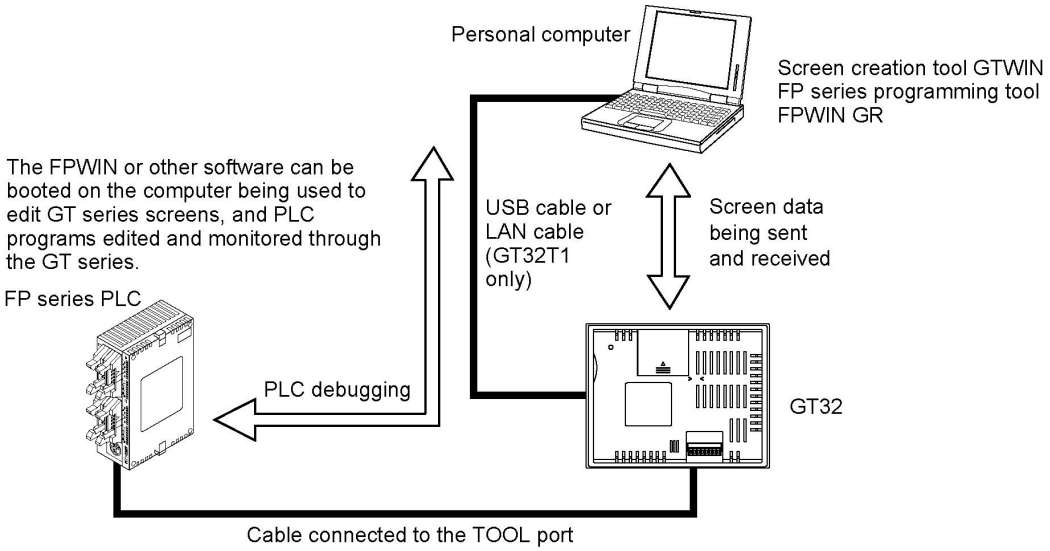
Through function is convenient for debugging

A convenient “through” function makes it possible to transfer data from the GT and carry out PLC debugging at the same time that communication is going on between the GT and the FP series PLC. This significantly boosts efficiency in the workplace.

For GT01, GT11, GT21 and GT30


FP series PLC
Cable connected to the TOOL port
GT
PLC debugging
Screen transfer cable AFC8503
Screen data being sent and received
The FPWIN or other software can be booted on the computer being used to edit GT series screens, and PLC programs edited and monitored through the GT series.
Screen creation tool GTWIN
FP series programming tool
FPWIN GR
Personal computer

For GT32 and GT05


Personal computer
Screen creation tool GTWIN
FP series programming tool
FPWIN GR
The FPWIN or other software can be booted on the computer being used to edit GT series screens, and PLC programs edited and monitored through the GT series.
USB cable or LAN cable (GT32T1 only)
Screen data being sent and received
FP series PLC
PLC debugging
GT32
Cable connected to the TOOL port

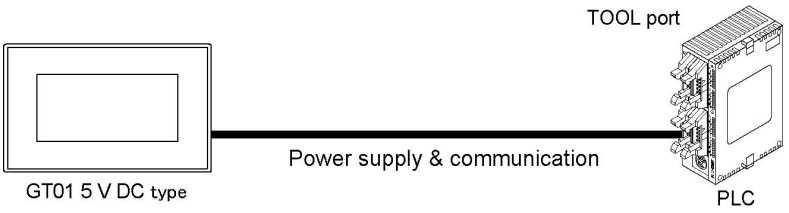
Note) Simultaneous USB and Ethernet transmission is not available for GT32T1.

New functions can be available by upgrading the GT. (GT01, GT11, GT21, GT32 and GT05)

The GT can be easily upgraded by donwloading the latest firmware from our website or using the GT Ver_UP tool.

1.2 About Power Supply for GT01 5 V DC Type

Power can be supplied to the GT01 5 V type with only one communication cable.
The power is supplied from the TOOL port of a PLC, therefore, the wiring man-hours can be significantly reduced.



Applicable models:

Panasonic FP series

Mitsubishi Electric Corporation FX series

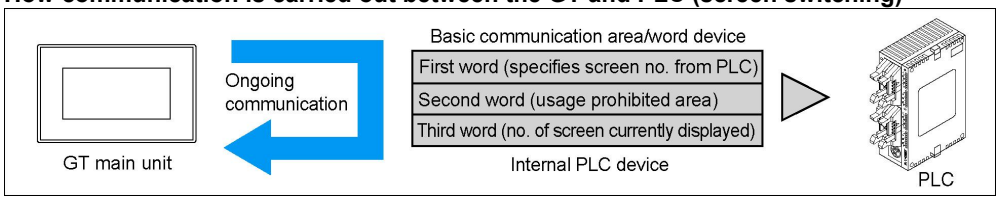
1.3 How to Switch Screens

There are three ways to switch screens registered in the GT.

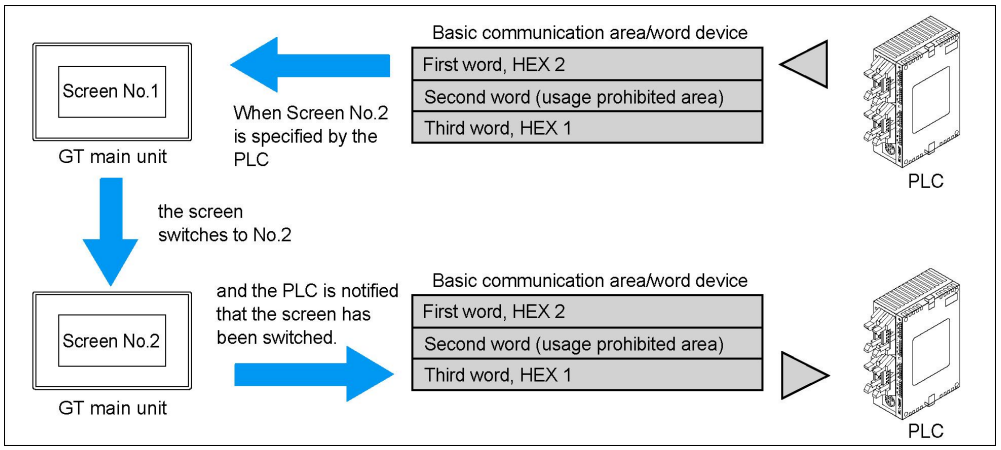
1.3.1 Setting from PLC Ladder Program

The screens can be switched by writing to the “basic communication area” from the PLC ladder program.

How communication is carried out between the GT and PLC (screen switching)


Basic communication area/word device
First word (specifies screen no. from PLC)
Second word (usage prohibited area)
Third word (no. of screen currently displayed)
Ongoing communication
GT main unit
Internal PLC device
PLC

How screens are switched

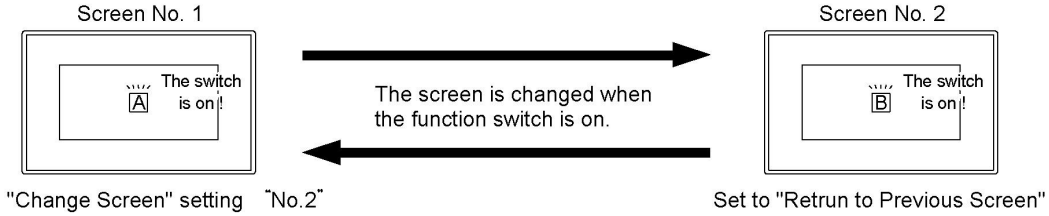

Basic communication area/word device
First word, HEX 2
Second word (usage prohibited area)
Third word, HEX 1
Screen No.1
GT main unit
When Screen No.2 is specified by the PLC
PLC
the screen switches to No.2
Screen No.2
GT main unit
and the PLC is notified that the screen has been switched.
Basic communication area/word device
First word, HEX 2
Second word (usage prohibited area)
Third word, HEX 1
PLC

1.3.2 Setting Function Switching Parts by GTWIN

The screens can be switched on the GT by using the “function switching parts” provided in the parts library of the GTWIN that has a function to switch the screens.
These parts should be arranged on the base screen and assigned the attributes indicated below.

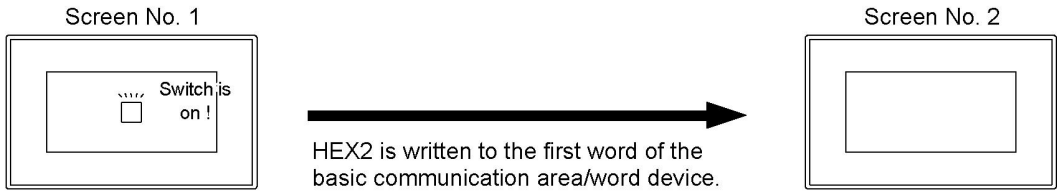
Using the “Change Screen” operation mode

The screen number to be changed can be specified for the function switch by selecting the “Change screen” operation mode. Press the switch part to switch the screen to the specified screen.
To return to the screen displayed just prior to the currently displayed screen, the “Return to Previous Screen” operation mode can be used.



Using the "Value Set" operation mode
Select the "Value Set" operation mode and enter the following settings:
- Data format : Specify 1 word
- Output destination : Specify to first word of basic communication area/word device
- Value : Number of screen to be changed to (hexadecimal specification)

Each time the GT switch part is pressed, the screen number is forcibly written by the GT to the first word of the basic communication area/word device, and the screen is switched.



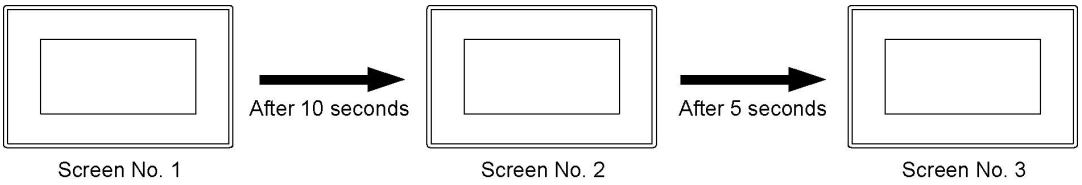
(Specify HEX2 for the value setting.)

Reference: <Terminal GTWIN Operational Guide Book ARCT1F357E> <GTWIN HELP>

1.3.3 Setting Auto-paging Function by GTWIN

The GT man unit has an "Auto-paging" function in the configuration setting that automatically switches the screen to a specified screen number when a certain period of time has elapsed. This function can be used to switch screens automatically.

(1) The screen number 1 is changed to the screen number 2 after 10 seconds.
(2) The screen number 2 is changed to the screen number 3 after 5 seconds.



Reference: <5.4.2 Auto-Paging>

1.4 Types of GT Series

1.4.1 GT Series

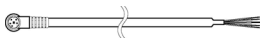
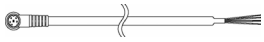
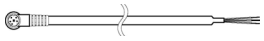
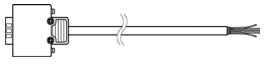
Item name	Model	Contents					Product No.
GT01 main unit	GT01	STN monochrome liquid crystal display	3-color LED Backlight (green, red, orange)	5V DC	RS232C type	Black	AIGT0030B1
						Ashgray	AIGT0030H1
					RS422/RS485 type	Black	AIGT0032B1
						Ashgray	AIGT0032H1
				24V DC	RS232C type	Black	AIGT0030B
						Ashgray	AIGT0030H
					RS422/RS485 type	Black	AIGT0032B
						Ashgray	AIGT0032H
			1-color LED Backlight (white)	5V DC	RS232C type	Black	AIGT0130B1
						Ashgray	AIGT0130H1
					RS422/RS485 type	Black	AIGT0132B1
						Ashgray	AIGT0132H1
				24V DC	RS232C type	Black	AIGT0130B
						Ashgray	AIGT0130H
					RS422/RS485 type	Black	AIGT0132B
						Ashgray	AIGT0132H
	GT01R		3-color LED Backlight (white, red, pink)	5V DC	RS232C type	Pure black	AIGT0230B1
						Silver	AIGT0230H1
					RS422/RS485 type	Pure black	AIGT0232B1
						Silver	AIGT0232H1
				24V DC	RS232C type	Pure black	AIGT0230B
						Silver	AIGT0230H
					RS422/RS485 type	Pure black	AIGT0232B
						Silver	AIGT0232H
GT05 main unit	GT05M	STN monochrome liquid crystal display	3-color LED Backlight (white, red, pink)	24V DC	RS232C type	Pure black	AIG05MQ02D
						Silver	AIG05MQ03D
					RS422/RS485 type	Pure black	AIG05MQ04D
						Silver	AIG05MQ05D
	GT05G		3-color LED Backlight (green, red, orange)		RS232C type	Pure black	AIG05GQ02D
						Silver	AIG05GQ03D
					RS422/RS485 type	Pure black	AIG05GQ04D
						Silver	AIG05GQ05D
	GT05S	STN color liquid crystal display	1-color LED Backlight (white)		RS232C type	Pure black	AIG05SQ02D
						Silver	AIG05SQ03D
					RS422/RS485 type	Black	AIG05SQ04D
						Ashgray	AIG05SQ05D
GT11 main unit	GT11	STN monochrome liquid crystal display	3-color LED Backlight (green,red, orange)	24V DC	RS232C type	Black	AIGT2030B
						Ashgray	AIGT2030H
					RS422/RS485 type	Black	AIGT2032B
						Ashgray	AIGT2032H
			1-color LED Backlight (white)		RS232C type	Black	AIGT2130B
						Ashgray	AIGT2130H
					RS422/RS485 type	Black	AIGT2132B
						Ashgray	AIGT2132H

Item name	Model	Contents					Product No.
GT21 main unit	**GT21**	STN color liquid crystal display	1-color LED Backlight (white)	24V DC	RS232C type	Pure black	AIGT2230B
						Silver	AIGT2230H
					RS422/RS485 type	Pure black	AIGT2232B
						Silver	AIGT2232H
GT30 main unit Note)	**GT30M**	STN mono-chrome liquid crystal display	CFL Backlight	24V DC	RS232C type	Black	AIGT3100B
						Ashgray	AIGT3100H
	GT30C	STN color liquid crystal display			RS232C type	Black	AIGT3300B
						Ashgray	AIGT3300H
GT32 main unit	**GT32M**	STN mono-chrome liquid crystal display	CFL Backlight	24V DC	RS232C type	Pure black	AIG32MQ02D
						Silver	AIG32MQ03D
					RS422/RS485 type	Pure black	AIG32MQ04D
						Silver	AIG32MQ05D
	GT32T0	TFT color liquid crystal display			RS232C type	Pure black	AIG32TQ02D
						Silver	AIG32TQ03D
					RS422/RS485 type	Pure black	AIG32TQ04D
						Silver	AIG32TQ05D
	GT32T1				RS232C type	Pure black	AIG32TQ12D
						Silver	AIG32TQ13D
					RS422/RS485 type	Pure black	AIG32TQ14D
						Silver	AIG32TQ15D

Note) A battery is supplied with the main unit.

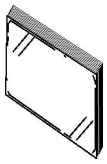
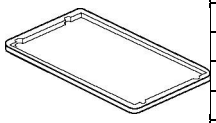
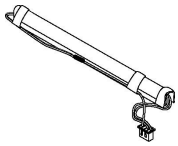
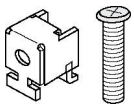
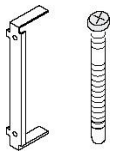
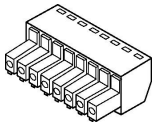
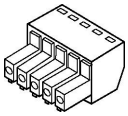
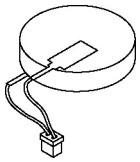
1.4.2 Options

PLC connecting cables

Item name	Contents		Product No.
	For direct connection to GT01 (5V DC/RS232C) and our FP-series TOOL port Mini-DIN 5-pin loose-wire cable * A ferrite core is supplied with the main unit.	2 m	AIGT8142
	For direction connection to GT01 (5V DC/RS422) and MITSUBISHI FX-series TOOL port Mini-DIN 8-pin loose-wire cable * A ferrite core is supplied with the main unit.	2 m	AIGT8152
	For connection to GT01 (24V DC), GT11, GT21, GT05, GT32 and our FP-series TOOL port Mini-DIN 5-pin loose-wire cable	2 m	AIGT8162
		5 m	AIGT8165
		10 m	AIGT8160
	For connection to GT01 (24V DC), GT11, GT21, GT05, GT32 and MITSUBISHI FX-series TOOL port Mini-DIN 8-pin loose-wire cable	5 m	AIGT8175
	For connection to GT10, GT30 and our FP-series TOOL port Mini-DIN 5-pin loose-wire cable	2 m	AIGT8192
	For connection to COM port of FP2/FP2SH and FP2 computer communication unit D-SUB 9-pin loose-wire cable	2 m	AIP81842

Note:

- About the connection to the COM ports of FPΣ and FP0
  As the connection to the COM port of FPΣ and FP0 is a loose-wire connection, a cable is not provided.

Item name		Contents		Product No.
Front panel protective sheet		GT01	For GT01. 10 in set. (sold separately)	AIGT080
			For GT01R. 10 in set. (sold separately)	AIGT080R
		For GT05. 10 in set. (sold separately)		AIG05800
		For GT11. 10 in set. (sold separately)		AIGT280
		For GT21. 10 in set. (sold separately)		AIGT28021
		For GT30 (for replacement). 10 in set. Note1)		AIGT380
		For GT32. 10 in set. (sold separately)		AIGT32800
Waterproof packing		For GT01 (for replacement). 10 in set. Note2)		AIGT081
		For GT05 (for replacement). 10 in set. Note2)		AIG05810
		For GT11 (for replacement). 10 in set. Note2)		AIGT181
		For GT21 (for replacement). 10 in set. Note2)		AIGT28121
		For GT30 (for replacement). 10 in set. Note2)		AIGT381
		For GT32 (for replacement). 10 in set. Note2)		AIG32810
Replacement backlight		For the GT30 color/monochrome liquid crystal display.		AIGT382
Attachment fittings		For GT01/GT11. 5 sets (4 pcs./set)		AIGT083
		For GT05/GT21/GT32. 5 sets (2 pcs./set)		AIGT28321
		For GT30. 5 set (2 pcs./set)		AIGT383
Connector		COM port connector for GT01/GT05/GT11/GT21/GT32. 5 in set		AIGT084
		COM port connector for GT30. 5 in set		AIGT184
Backup battery		For GT32/GT05 (The backup battery for FP-X is used.)		AFPX-BATT

Note1) One sheet is attached to the main unit.
Note2) One packing is attached to the main unit.

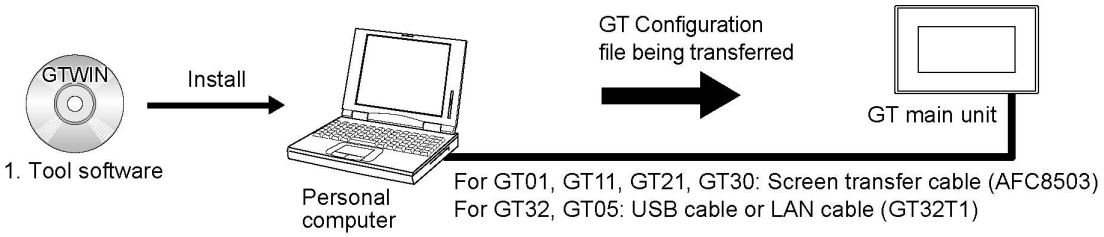
1.5 Screen Creation Tool

1.5.1 Tools Required for Screen Creation

1. Tool software
It can be used for all the models in the GT series.

2. Screen transfer cable (Cable for connecting a PC)
For GT01, GT11, GT21 and GT30:
A cable for DOS/V PC is provided.

For GT32 and GT05:
Prepare a commercal USB cable or LAN cable.


GTWIN
Install
1. Tool software
Personal computer
GT Configuration file being transferred
GT main unit
For GT01, GT11, GT21, GT30: Screen transfer cable (AFC8503)
For GT32, GT05: USB cable or LAN cable (GT32T1)

1.5.2 Software Usage Environment and Applicable Cables

Screen creation tool software Terminal GTWIN Ver. 2

Software type		Required OS	Hard disk capacity	Product No.
Terminal GTWIN Ver. 2 English-language version	Tool	Windows® 2000 Windows® XP	300 MB or more	AIGT8001V2
	Upgrade			AIGT8001V2R

Note) Terminal GTWIN Operational Guide Book <ARCT1F357E> is provided together with the terminal GTWIN English-language version.

For GTWIN Ver. 2.71 or older
It can be also used on Windows® 95 (OSR2 (Ver. 4.00.950B) or later), Windows® 98, Windows® Me or Windows NT® (Ver. 4.0 or later).

In order to use the Help function
Internet Explorer 4.0 (or a subsequent version) by Microsoft must be installed in order to use GTWIN Help function. If you do not have the appropriate version of Internet Explorer, it can be downloaded from the Microsoft website.
(Particular caution is required if using Windows® 95 or Windows NT®.)

If using Windows NT® or Windows® 2000 or Windows® XP
Please be aware that GTWIN cannot be installed unless you log in at the Administrator level when booting the system. After the installation, GTWIN can be used at the Administrator or Power User level.

Related software (Freeware)

Item name	Contents
Configurator WD IP address search tool	Address setting for the GT in Ethernet communication

Note) It can be downloaded from our website (http://www.mew.co.jp/ac/).
(User registration is required. Free of charge)

Screen transfer cable

For PC (RS232C) and GT series unit (TOOL port)

Item name	Contents	Product No.
Screen transfer cable	Screen data trasfer cable for GTWIN, GT01, GT11, GT21 and GT30	AFC8503
	Screen data trasfer cable for GTWIN and GT series. Mini-DIN 5-pin straight type	AFC8503S

Note) A USB/RS232C conversion cable is required to connect a PC without a serial port with the cable for the PC.

For PC (USB) and GT series unit (USB)

USB cable (GT32 and GT05)
Use a commercal cable.

Cable type	Length	Applicable GTWIN version
USB2.0 (or 1.1) AB type	Max. 5 m	Ver. 2.80 or later

Reference: <2.5 Connecting to Screen Creation Tool GTWIN>

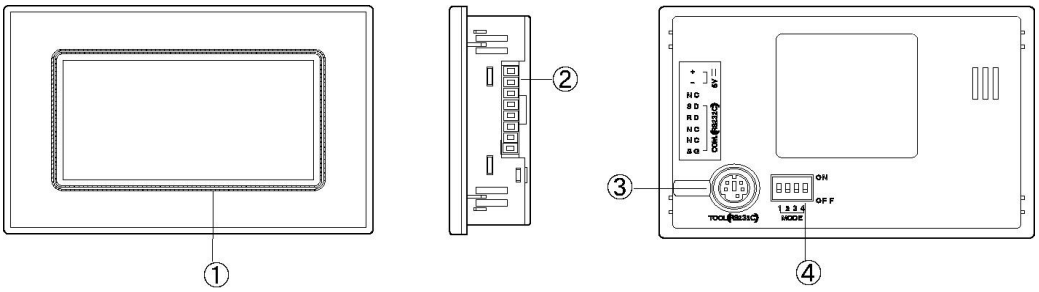
Chapter 2

Names and Functions of Parts

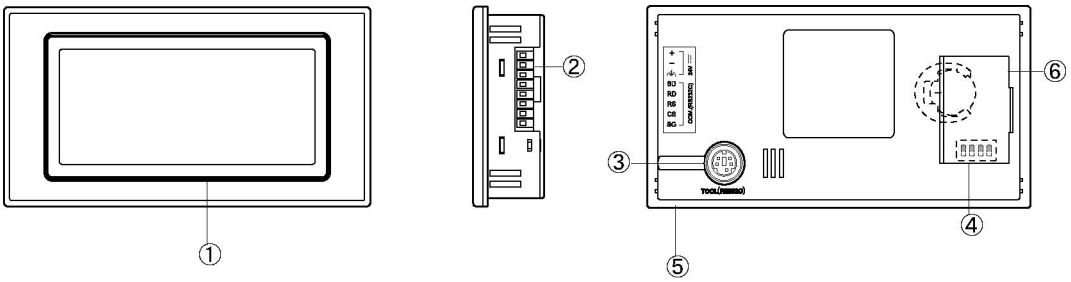
2.1 Part Names

2.1.1 GT01, GT11 and GT21

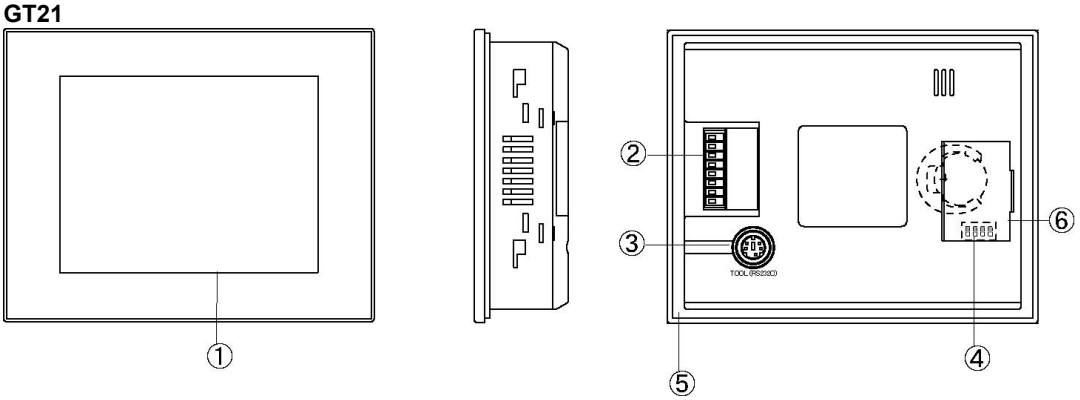
GT01/GT01R



GT11



GT21



① **Touch screen**

Various screens are displayed here. Switches can be operated and data entered simply by touching the touch screen.

(A sheet is affixed to the touch panel to protect it from scratches when shipping. Please remove it before using the GT.)

Optional protective sheets are available to protect the touch screen surface and keep it cleean.

Reference: <1.4.2 Options>

② **COM port and power supply terminal**

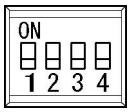
This is a communication port (RS232C or RS422) for connecting to a PLC, host PC, or microcomputer board, and a 5 V DC operation power supply terminal.

③ **TOOL port (GTWIN connection port)**

This port is used to connect the screen creation tool.

④ **Operation mode setting switches**

Screen data and configuration settings data are stored in an internal F-ROM, so no battery backup is needed. The operation mode setting swtich has a switch that prohibits access to the System Menu.



(Factory default)

Switch No.	Function	OFF	ON
1	Usage inhibited	Should always be in the OFF position when unit is used.	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the OFF position when unit is used.	
4			

⑤ **Waterproof packing**

This assures that the front panel is waterproof.

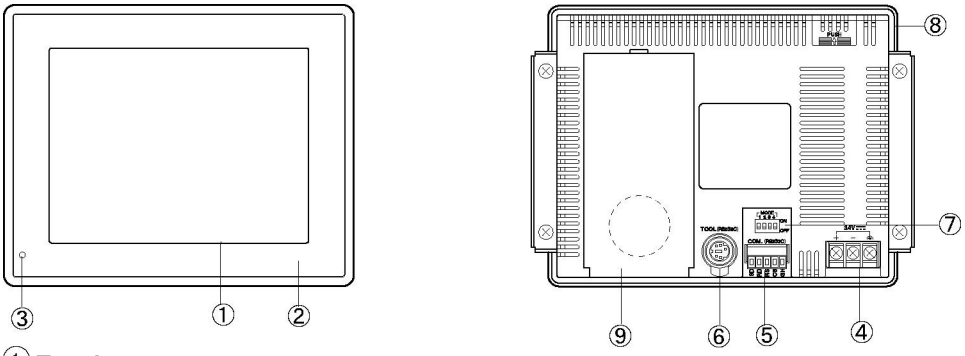
⑥ **Battery cover (for GT11 and GT21)**

When using a backup battery to be separately purchased, open this battery cover to install it.

The clock, PL Cdevice holde data, alarm history and GT internal device hold data functions can be used with the backapu battery.

Reference: <3.5.2 How to Install the Battery>

2.1.2 GT30



① **Touch screen**
Various screens are displayed here. Switches can be operated and data entered simply by touching the touch screen.

② **Front panel protective sheet**
This protects the touch screen surface and keeps it clean.

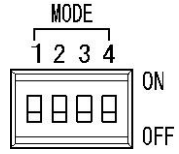
③ **Power lamp**
The light is on when the power supply is turned on.

④ **Power supply terminal**
The operation power supply is connected here.

⑤ **COM port**
This is a RS232C port for connecting to a PLC, host PC, or microcomputer board.

⑥ **TOOL port (GTWIN connection port)**
This port is used to connect the screen creation.

⑦ **Operation mode setting switches**
The operation mode setting switches control the ability to shift to the system menu.



(Factory default))

Switch No.	Function	OFF	ON
1	Usage inhibited	Should always be in the OFF position when unit is used.	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the OFF position when unit is used.	
4			

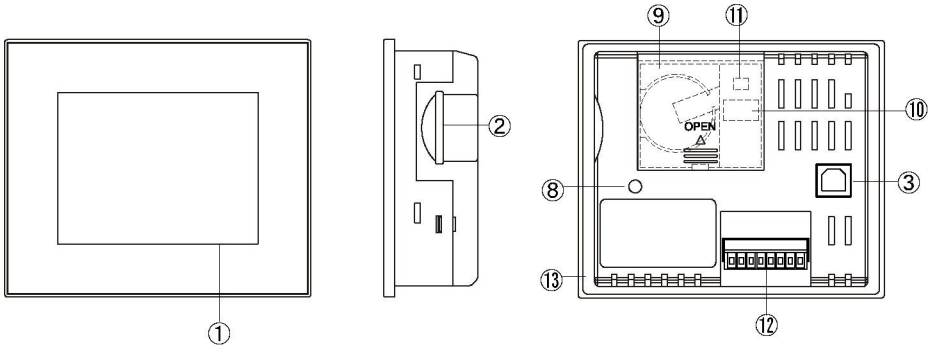
⑧ **Waterproof packing**
This assures that the front panel is waterproof.

⑨ **Battery holder**
Although a battery has been installed, an insulation sheet is inserted to prevent the battery discharging. Remove the sheet before using the unit.
The clock, PL Cdevice holde data, alarm history and GT internal device hold data functions can be used with the backapu battery.

Reference: <3.5.2 How to Install the Battery>

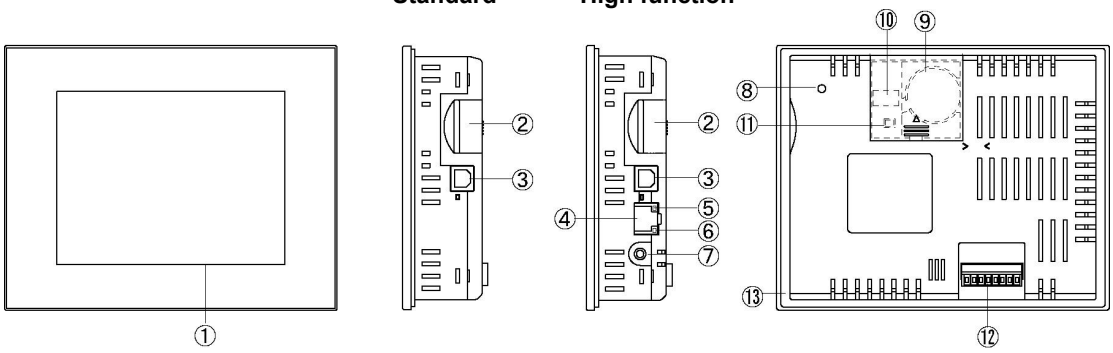
2.1.3 GT05/GT32

GT05



GT32

Standard **High function**



① **Liquid crystal display panel/touch panel**

Various screens are displayed here. A touch panel is provided on the liquid crystal display panel, and switches can be operated and data entered simply by touching the panel.
Optional protective sheets are also available to protect the touch panel and keep it cleean.
(A sheet is affixed to the touch panel to protect it from scratches when shipping. Please remove it before using the GT.)

Reference: <1.4.2 Options>

② **SD memory card slot**

A SD memory card is inserted in this slot.

Note:

- Saving from GTWIN: Operate on the GTWIN screen using a SD memory card read/writer.
- Savving from GT main unit: Operate on the SD memory card setting screen under the system menu.

Reference: <5.3.8 Setting Mode “SD Memory Card” (GT32 and GT05)>

③ **USB port (B type)**

This is a connector for connecting the screen creation tool. The commercal USB cable (AB type) can be used.

④ **Ethernet port (RJ45) (GT32T1)**

This is a connector for connecting the screen creation tool. The maximum baud rate is 115200 bps when using Ethernet.

⑤ **SPEED lamp (GT32T1)**

It shows the baud rate when using Ethernet.
Light on: During 100Base communication
Blinking: During 10Base communication

⑥**LINK/ACT lamp (GT32T1)**

it shows the state of communciation with Ethernet.
Light on: When linked
Blinking: While data reception

⑦**Sound output jack (GT32T1)**

Insert the speaker with a ϕ 3.5-mini plug amplifier for using the audio output function.

⑧**SD memory access lamp**

The lamp turns on while accessing a SD memory card.

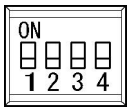
⑨**Battery cover**

When using a backup battery to be separately purchased, open this battery cover to install it.
The clock, PL Cdevice holde data, alarm history and GT internal device hold data functions can be used with the backapu battery.

Reference: <3.6.4 How to Install the Battery (GT32 and GT05)>

⑩ **Operation mode setting switches**

Screen data and configuration settings data are stored in an internal F-ROM, so no battery backup is needed. The operation mode setting swtich has a switch that prohibits access to the System Menu.



(Factory default)

Switch No.	Function	OFF	ON
1	Usage inhibited	Should always be in the OFF position when unit is used.	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the OFF position when unit is used.	
4			

⑪ **Mounting location of connector for battery**

⑫ **COM port (PLC/external device connection port) and power supply terminal**

This is a communication port (RS232C or RS422) for connecting to a PLC, host PC, or microcomputer board, and a 5 V DC operation power supply terminal.

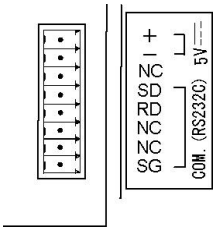
⑬ **Waterproof packing**

This assures that the front panel is waterproof.

2.2 Terminal Layouts of COM Port

2.2.1 GT01

5 V/RS232C type

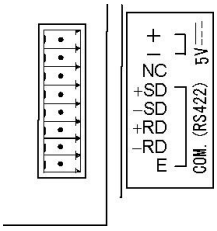


Pin No.	Name	Abbre.	Signal direction	Product No.
1	+5 V	+	-	AIGT0030B1 AIGT0030H1 AIGT0130B1 AIGT0130H1 AIGT0230B1 AIGT0230H1
2	0 V	–	-	
3	Not connected	NC	-	
4	Send data	SD	GT→External device	
5	Receive data	RD	GT←External device	
6	Not connected	NC	-	
7	Not connected	NC	-	
8	Signal ground	SG	-	

Note:

- There is no RS and CS (control lines).

5 V/RS422(RS485) type

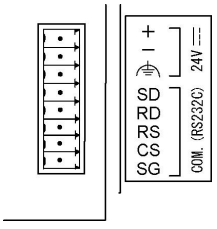


Pin No.	Name	Abbre.	Signal direction	Product No.
1	+5 V	+	-	AIGT0032B1 AIGT0032H1 AIGT0132B1 AIGT0132H1 AIGT0232B1 AIGT0232H1
2	0 V	–	-	
3	Not connected	NC	-	
4	Send data	+SD	GT→External device(+)	
5	Send data	–SD	GT→External device(–)	
6	Receive data	+RD	GT←External device(+)	
7	Receive data	–RD	GT←External device(–)	
8	Terminal resistance	E	-	

Note:

- There is no RS and CS (control lines).

24 V/RS232C type

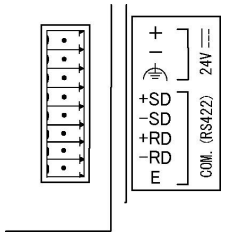


Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT0030B AIGT0030H AIGT0130B AIGT0130H AIGT0230B AIGT0230H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	SD	GT→External device	
5	Receive data	RD	GT←External device	
6	Not connected	NC	-	
7	Not connected	NC	-	
8	Signal ground	SG	-	

Note:

- There is no RS and CS (control lines).

24 V/RS422(RS485) type



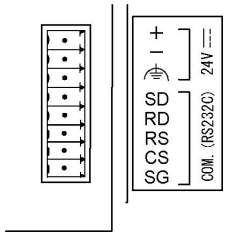
Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT0032B AIGT0032H AIGT0132B AIGT0132H AIGT0232B AIGT0232H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	+SD	GT→External device(+)	
5	Send data	–SD	GT→External device(–)	
6	Receive data	+RD	GT←External device(+)	
7	Receive data	–RD	GT←External device(–)	
8	Terminal resistance	E	-	

Note:

- There is no RS and CS (control lines).
- E is used to set the terminal unit.

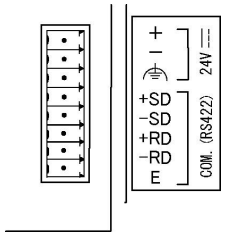
2.2.2 GT11

24 V/RS232C type



Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT2030B AIGT2030H AIGT2130B AIGT2130H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	SD	GT→External device	
5	Receive data	RD	GT←External device	
6	Request to send	RS	GT→External device	
7	Clear to send	CS	GT←External device	
8	Signal ground	SG	-	

24 V/RS422(RS485) type



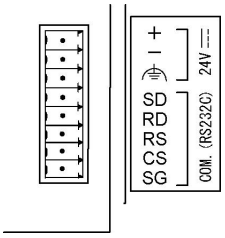
Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT2032B AIGT2032H AIGT2132B AIGT2132H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	+SD	GT→External device(+)	
5	Send data	–SD	GT→External device(–)	
6	Receive data	+RD	GT←External device(+)	
7	Receive data	–RD	GT←External device(–)	
8	Terminal resistance	E	-	

Note:

- There is no RS and CS (control lines).

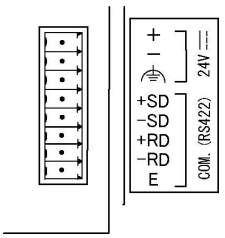
2.2.3 GT21

24 V/RS232C type



Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT2230B AIGT2230H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	SD	GT→External device	
5	Receive data	RD	GT←External device	
6	Request to send	RS	GT→External device	
7	Clear to send	CS	GT←External device	
8	Signal ground	SG	-	

24 V/RS422(RS485) type

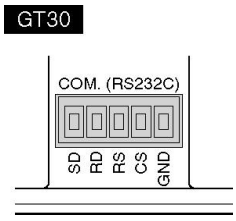


Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIGT2232B AIGT2232H
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	+SD	GT→External device(+)	
5	Send data	–SD	GT→External device(–)	
6	Receive data	+RD	GT←External device(+)	
7	Receive data	–RD	GT←External device(–)	
8	Terminal resistance	E	-	

Note:

- There is no RS and CS (control lines).

2.2.4 GT30



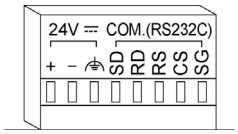
Pin No.	Name	Abbre.	Signal direction	Product No.
1	Send data	SD	GT→External device	AIGT3100B AIGT3100H AIGT3300B AIGT3300H
2	Receive data	RD	GT←External device	
3	Request to send	RS	GT→External device	
4	Clear to send	CS	GT←External device	
5	Signal ground	GND	-	

Note:

- When connecting the unit to the FP series, there is no need to wire both the RS and CS.

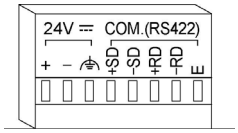
2.2.5 GT05/GT32

24 V/RS232C type



Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIG05MQ02D AIG05MQ03D AIG05GQ02D AIG05GQ03D AIG05SQ02D AIG05SQ03D AIG32MQ02D AIG32MQ03D AIG32TQ02D AIG32TQ03D AIG32TQ12D AIG32TQ13D
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	SD	GT→External device	
5	Receive data	RD	GT←External device	
6	Request to send	RS	GT→External device	
7	Clear to send	CS	GT←External device	
8	Signal ground	SG	-	

24 V/RS422(RS485) type



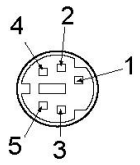
Pin No.	Name	Abbre.	Signal direction	Product No.
1	+24 V	+	-	AIG05MQ04D AIG05MQ05D AIG05GQ04D AIG05GQ05D AIG05SQ04D AIG05SQ05D AIG32MQ04D AIG32MQ05D AIG32TQ04D AIG32TQ05D AIG32TQ14D AIG32TQ15D
2	0 V	–	-	
3	Functional ground	FG	-	
4	Send data	+SD	GT→External device(+)	
5	Send data	–SD	GT→External device(–)	
6	Receive data	+RD	GT←External device(+)	
7	Receive data	–RD	GT←External device(–)	
8	Terminal resistance	E	-	

Note:

There is no RS and CS (control lines).

2.3 Connecting to Screen Creation Tool GTWIN

2.3.1 TOOL Port (GT01, GT11, GT21, GT30)



Pin No.	Name	Abbre.	Signal direction
1	Signal ground	SG	-
2	Send data	SD	GT→External device
3	Receive data	RD	GT←External device
4	Not connected	N.C.	-
5	+5 V	(+5V)	-

Note:

- The +5V of Pin 5 is reserved for the FP Programmer II. It should not be used for any other application. If using it, there is a restriction on the ambient temperature. The pin 5 of GT01 is N.C.

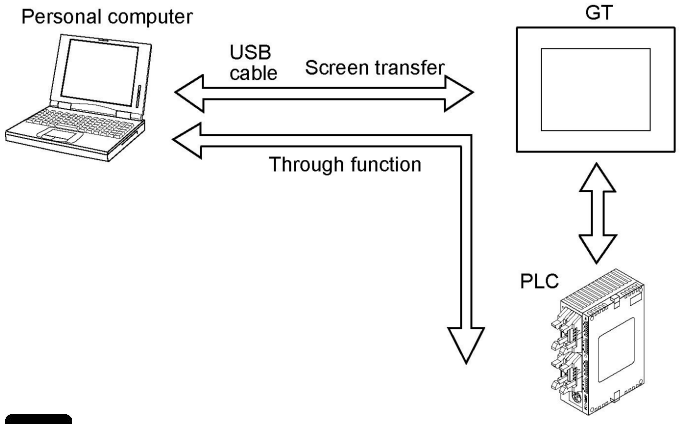
2.3.2 USB Port (GT05, GT32)

USB connection

GT05 and GT32 has a USB port.
Communication with our software such as GTWIN becomes available by connecting to a PC with a USB cable.

Functions enabled by USB connection

- Through function using our PLCs
- Screen transfer (The communication in a speed approximately 3 times of the one with the Ethernet connection is possible.)



Note: If more than one programmable display unit or IPDs are connected to a PC using the USB port, the communication is not available.

Required items for the connection

- **Personal computer**

  A personal computer with the following OS is required for connecting the GT with the USB cable.

Windows®2000 **Windows®XP**

- **GTWIN**

  The following GTWIN is required.

GTWIN: Ver. 2.80 or later

Note:

For upgrading the GTWIN, download the difference file from our website.
URL: http://www.mew.co.jp/ac/e/fasys/hmi/ (User registration is required.: Free of charge)

- **USB cable**

Prepare a commercial USB cable.

A maximum of 5 m cable (AB type) for USB2.0 (or 1.1)

- **Installation of the USB driver**

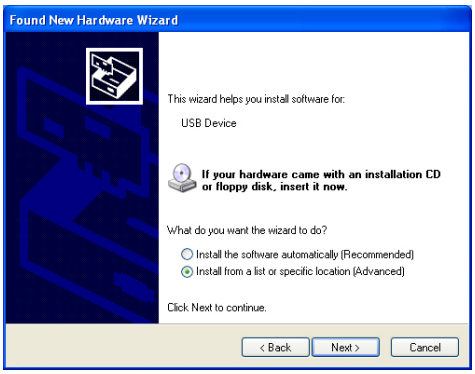
The USB driver must be installed for connecting the USB.
Install it in the following procedure. (For both the CD and download version of the GTWIN, follow the procedure below.)

(1) Turn on the power supply of GT, and connect the GT and a PC with a USB cable.

(2) After the connection, the PC automatically detects the USB driver. The “Found new hardware wizard” screen is dispalyed.

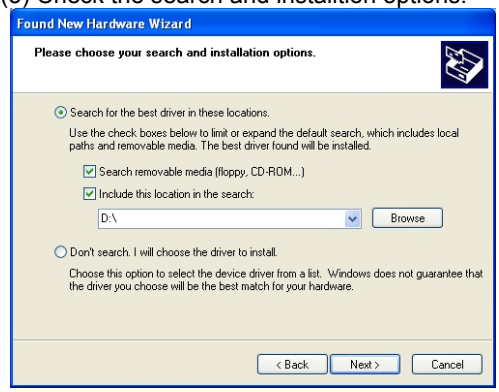
Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

Select “No, not this time”, and click [Next].


Found New Hardware Wizard
This wizard helps you install software for:
USB Device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

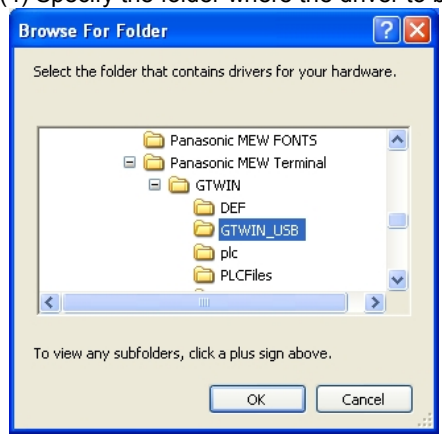
Select “Install from a list or specific location (Advanced)”, and click [Next].

(3) Check the search and installtion options.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Select “Don’t search. I will choose the driver to install.”, and click [Next].

(4) Specify the folder where the driver to be isntalled is saved.

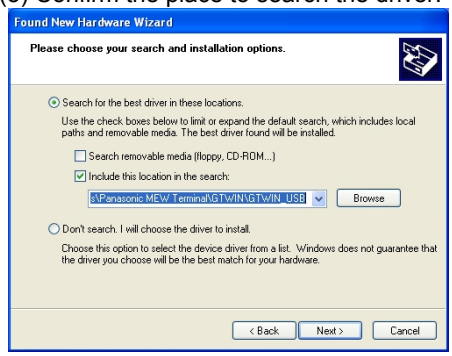


Specify the following folder, and click [OK].

Folder to be specified:
\Program Files\Panasonic MEW Terminal\GTWIN\GTWIN_USB

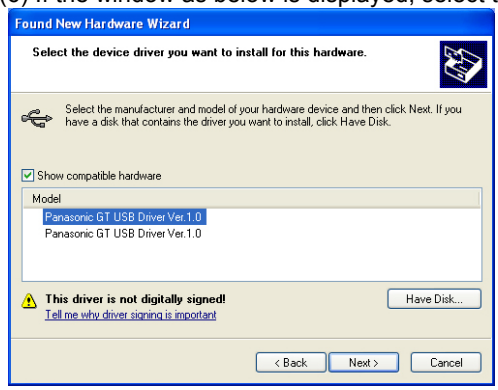
* If the driver is not in the above folder, specify the foler where the GTWIN has been installed.

(5) Confirm the place to search the driver.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
a:\Panasonic MEW Terminal\GTWIN\GTWIN_USB
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

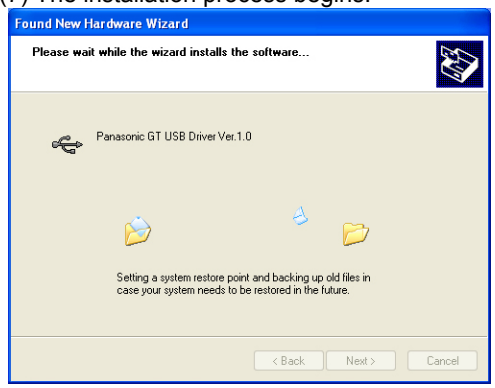
Confirm the sepcified folder, and click [Next].

(6) If the window as below is displayed, select the driver to be installed.


Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Show compatible hardware
Model
Panasonic GT USB Driver Ver.1.0
Panasonic GT USB Driver Ver.1.0
This driver is not digitally signed!
Tell me why driver signing is important
Have Disk...
< Back
Next >
Cancel

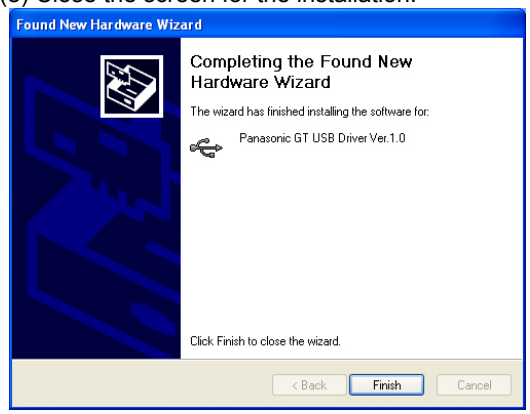
If the PC has more than one USB port and a USB driver has been already installed, the display shown in the left column is displayed. Select either driver, and click [Next].

(7) The installation process begins.


Found New Hardware Wizard
Please wait while the wizard installs the software...
Panasonic GT USB Driver Ver.1.0
Setting a system restore point and backing up old files in case your system needs to be restored in the future.
< Back
Next >
Cancel

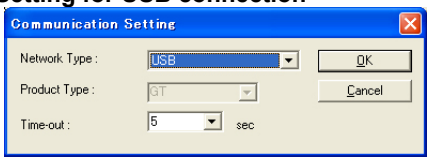
A message is displayed on the screen indicating that the installation is in progress, and the installtion of the USB driver begins.

(8) Close the screen for the installation.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Panasonic GT USB Driver Ver.1.0
Click Finish to close the wizard.
< Back
Finish
Cancel

A message is diplayed on the screen indicating that the installation completed. Click [Finish] to close the screen.

Setting for USB connection



This setting is necessary for transferring screens using GTWIN.
Select [GTWIN]→[File]→[Transfer]→[Condition]→[Network type], and change it to [USB].
Click [OK].

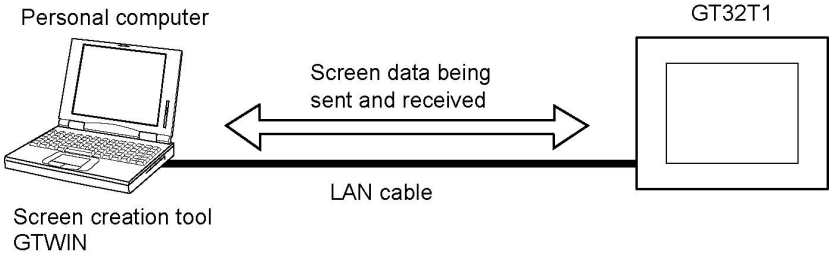
2.3.3 Ethernet Port (GT32T1)

Ethernet connection

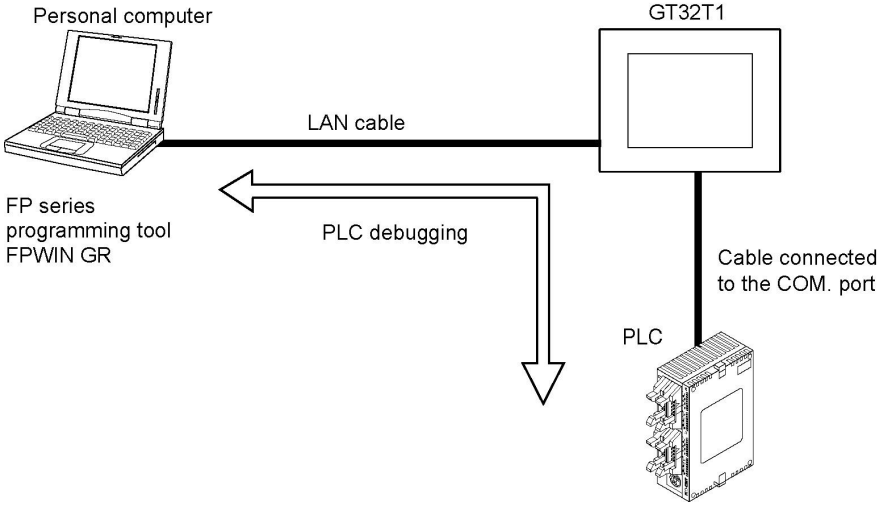
GT32T1 has a Ethernet port. Communication with our software such as GTWIN becomes available by connecting to a PC with a LAN cable.

Ethernet communication function

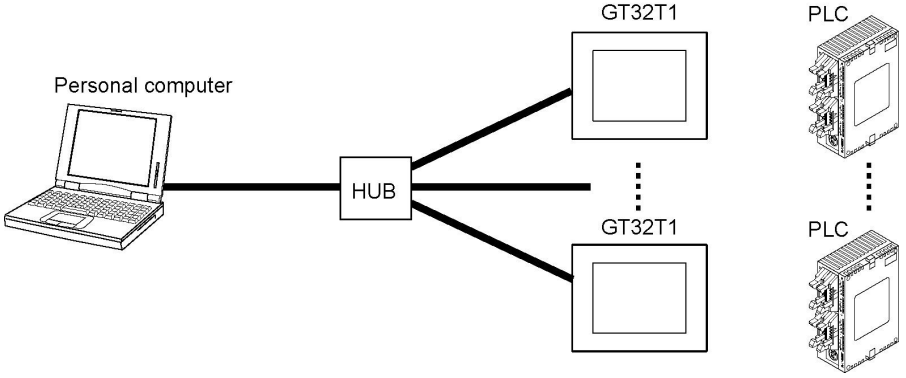
- Screen transfer (Baud rate: fixed at 115200 bps. It takes at least 3 times longer than the transfer using USB.)



- Through function using our PLCs



* Specifying the destinations to connect enables the communication with multiple units using a HUB.



Required items for the connection

- **LAN cable**

  Either straight cable or crossing cable can be used.
(MDI/MDI-X Automatic crossover function)

Reference: For the information on precautions when wiring Ethernet port,
<3.5 Precautions when Wiring Ethernet Port>

Settings for the Ethernet connection

Follow the procedure below to communicate with the Ethernet connection.

1. Connect the GT to a PC with a Ethernet cable.
2. Specify the settings such as IP address for the GT.
3. Startup the GTWIN and specify the communication condition.

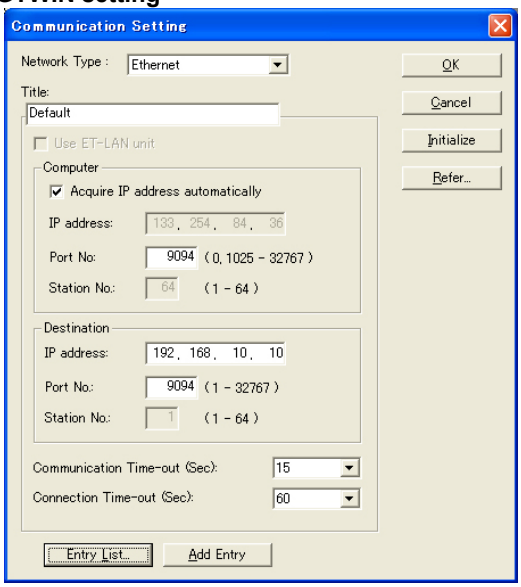
The factory settings are as follows.

IP Address	**192.168.1.5**
Subnetmask	**255.255.255.0**
Default Gateway	**192.168.1.**
Port No	**9094**

Note) Setting items such as IP address for the GT can be specified in the System Menu.

Reference: <5.6.4 Setting Mode: “Communication Parameters” (COM port/Ether Port)>

GTWIN setting

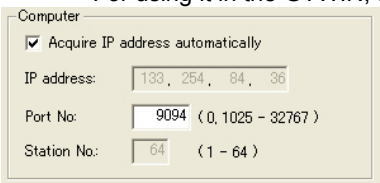


Network type: Ethernet
Title: Input an arbitrary title (Up to 38 one-byte characters)
Computer:
Check “Acquire IP address automatically”.
The default setting is to use the IP address currently being used in the computer.
Click [OK] to finish the setting.

Note) When sing multiple Ethernet cards, specify manually.

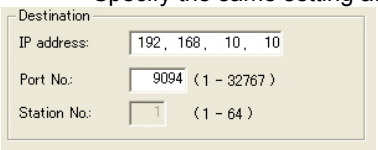
IP address: When it is not displayed, set the property of the TCP/IP in the items such as Network of the control panel. IP address can be input or changed.
Note) The setting procedure varies depending on the OS used. For the details, refer to the manual/help of the OS.

Port No.: Set to 0 or within the range of 1025 to 32767 in decimal.
For using it in the GTWIN, set it to 0.

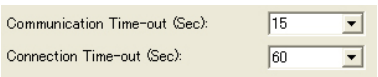


- **Setting of destination (PLC side)**

IP address: Specify the IP address of the GT to be connected in decimal.
Port No.: Set it within the range of 1 to 32767 in decimal. (Default: 9094)
Specify the same setting as the one of GT.



- **Communication time out:** Set the time-out period after connection establishment for every communication within the range of 1 to 950 seconds. (Default: 15) (it is not linked to this setting until a connection is estalished)
- **Connection time out:** Set the time-out period until connection establishment within the range of 1 to 180 seconds. (Default: 60)



Setting with IP search tool (Config WD. exe)

The settings of the GT can be specified with the IP address search tool of Configurator WD (Ver.1.11 or later).

The IP search tool (Config WD. Exe) can be downloaded for free from our website

URL: http://www.mew.co.jp/ac/e/ (User registration is required.: Free of charge)

Chapter 3

Installation and Wiring

3.1 Installation

3.1.1 Installation Environment

When installing and using the GT series, always make sure the following conditions are observed.

Usage conditions

When installing the product, make sure it is used within the range of the general specifications. Do not use in the following environments:

- Direct sunlight, wind and rain. (This product is not designed for outdoor use.)
- Ambient temperature outside the range of 0 to +50°C.
- (When installing the unit in a control panel, carefully consider radiation. Also, do not install the unit immediately above any devices generating heat.)
- Ambient humidity outside the range of 20% to 85% RH (at 25°C, non-condensing).
- Sudden temperature changes causing condensation.
- Inflammable or corrosive gas.
- Excessive airborne dust, metal particles or saline matter.
- Areas where substances such as organic solvents (thinner, benzin, alcohol), strong alkali substances (ammonia, caustic soda), grinding fluid or cutting oil may adhere to the unit or in those atmospheres.
- Direct vibration, shock or direct drop of water.
  (This unit is warranted by IP65 for panel mounting, however, this applies to initial values.)
- Influence from power transmission lines, high voltage equipment, power cables, power equipment, radio transmitters, or any other equipment that would generate high switching surges.
  Use the unit within the range of the general specifications when installing.
- For use in pollution Degree 2 environment

Power supply wiring

- For the power supply, use twisted wire (strand wire).
- There is sufficient noise resistance to offset power line noise, but we recommend reducing noise by measures such as installing an insulated transformer. If necessary, we recommend to take measures such as installing a ferrite core.
- Separate wiring systems should be used for the power supply and operating unit.

Static Electricity/Noise

- Keep the programmable display unit, PLC connecting cable and power wire as far as possible from machines that are likely to produce noise such as a welding machine, power line, inverter and motor. Especially for the control line communication cable, do not bundle it together with a power line or high-tension line, or do not wire it near those lines. Keep it clear of power lines and high-tension lines at least approx. 200 m. Failure to do so could lead to malfunction due to noise.
- For use in environments where the frequent occurrence of static electricity, radiation, or induced noise can be expected, the use of shielded cable on all wiring and grounding of shield (1-point ground) is recommended. When wiring the equipment, shielded wires should be electrically insulated to signal lines and signal grounds.
- If excessive static electricity is applied to the panel surface, the LCD display unit may be damaged.
- Before touching the main unit, always touch a grounded piece of metal in order to discharge static electricity.

3.1.2 Installation Space

Applicable panel thickness

A panel with a thickness of 1.0 to 5.0 mm should be used.

Clearance when the GT is installed

When installing the GT unit, if other parts are being installed to the panel or cables are being wired to it, we recommend providing a clearance around the GT unit. This prevents cables from being damaged, and facilitates the installation work. Also, make sure that the slits in the main unit are never obstructed.

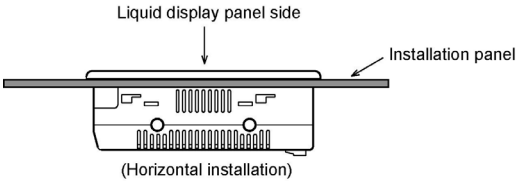
Model name	Clearance
GT01	30 to 50 mm
GT11	
GT21	
GT30	
GT32	30 to 60 mm
GT05	

Note:

Ambient usage temperature when the unit is installed in a horizontal orientation (GT21, GT30, GT32)

If the unit is being installed in a horizontal orientation and the Matsushita Programmer II and C-NET adaptor are being connected to the TOOL port, note that the ambient usage temperature should be as below.

Model name	Ambient temperature
GT21	0 to 45 °C
GT30	0 to 40 °C
GT32	



When using the GT11 connecting our Programmer II or C-NET adapter to the TOOL port

Usable ambient temperature is 45 °C.

3.1.3 UL/c-UL Qualification

Be aware of the following when applying for UL standard for the equipment that the GT has been built in.

- When the GT built in equipment, the GT should meet the standard as a part of the enclosure.
- As the rear of the GT is not qualified as an enclosure, provide a fire enclosure (metal barrier) that entirely covers the rear and lateral sides of the GT.

3.1.4 Mounting Screws

Secure the GT to the installation panel using the ffittings and screws provided with the unit.

Recommended screws

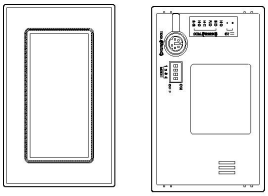
Recommended product	GT unit	Size	Others	Quantity
Mounting screw	GT01/GT11	M3 – 20	Material: SW pane-head (+) Galvanization, trivalent chromate	4 pcs/unit
	GT30	M3 – 25		
	GT05/GT21/GT32	M3 – 3.5		

The screw tightening torque should be 0.1 to 0.25 N· m, and tighten them securely.
Tightening the screws too hard can cause deformation of the front panel, so that the switch will not function properly. Make sure screws are tightened to the appropriate degree.

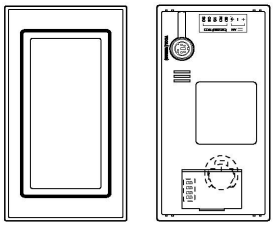
3.1.5 Installing in Vertical Orientation (GT01, GT11, GT21)

Normally, the GT series is installed horizontally long, however, some models can be installed vertically long. At that time, the right side becomes the upper side.

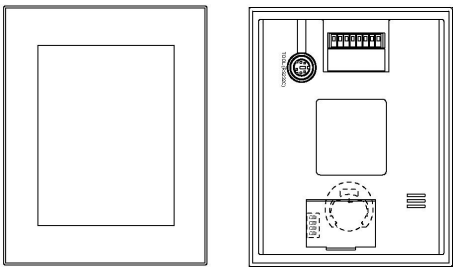
GT01



GT11

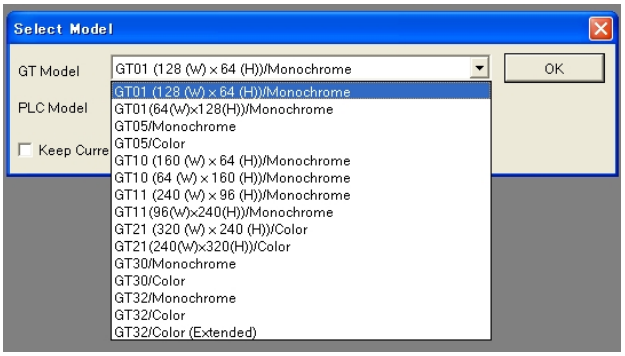


GT21



Note:
The side that the COM port is situated becomes the upper side. If the GT is installed upside down, the screen will be upside down.

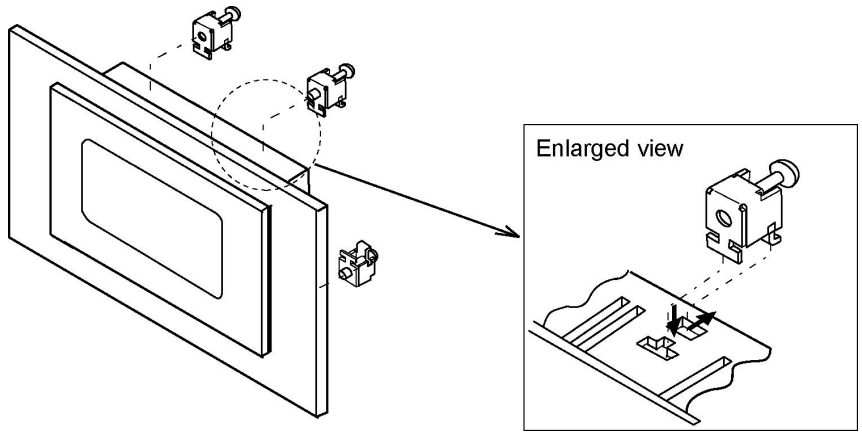
Key Point: Select the vertical type when selecting a GT model in GTWIN.



3.1.6 GT01 and GT11 Installation Method

Secure the GT to the installation panel using the four fittings and four screws provided with the unit.

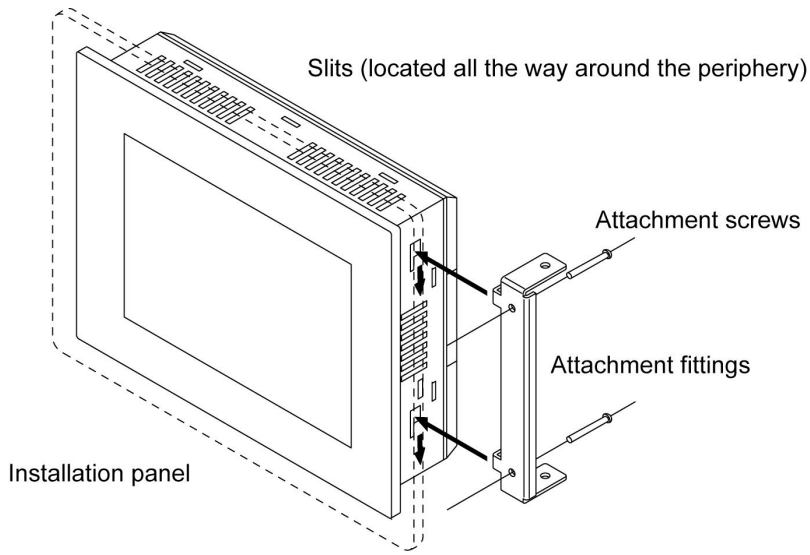
1. Place the GT in the installation panel.
2. Insert the fittings into the grooves provided in the GT, and tighten the screws to secure the GT to the installation panel.



3.1.7 GT21 Installation Method

Secure the GT21 to the installation panel using the two fittings and four screws provided with the unit.

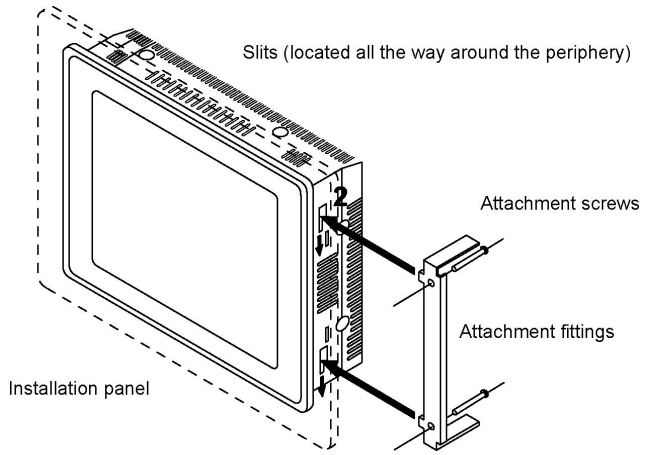
1. Place the GT21 main unit in the installation panel.
2. Insert the fittings into the grooves provided in the GT21 main unit, and tighten the screws to secure the GT21 main unit to the installation panel.



3.1.8 GT30 Installation Method

Secure the GT30 to the installation panel using the two fittings and four screws provided with the unit.

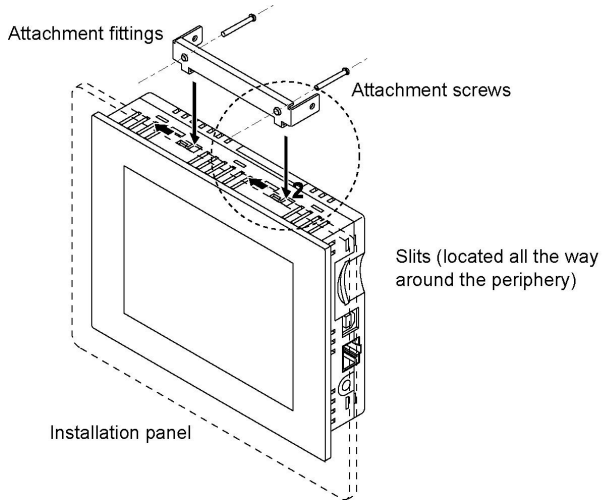
1. Place the GT30 main unit in the installation panel.
2. Insert the fittings into the grooves provided in the GT30 main unit, and tighten the screws to secure the GT30 main unit to the installation panel.



3.1.9 GT05/GT32 Installation Method

Secure the GT32 to the installation panel using the two fittings and four screws provided with the unit.

1. Place the GT main unit in the installation panel.
2. Insert the fittings into the grooves provided in the GT main unit, and tighten the screws to secure the GT main unit to the installation panel.



3.1.10 Precaution When reinstalling GT

When the GT is reinstalled after being removed from the panel, the water-proof packing should be replaced.

Reference: <3.5 Water-proof Packing>

3.2 Wiring the Power Supply

3.2.1 Wiring the Power supply

The power supply should be wired by securely connecting the terminal on the rear of the main unit to the terminal.

Use twisted wiring for the power supply

In order to minimize influence from noise, the wiring for the power supply should be twisted.

Insulate the power supply inside a protective circuit

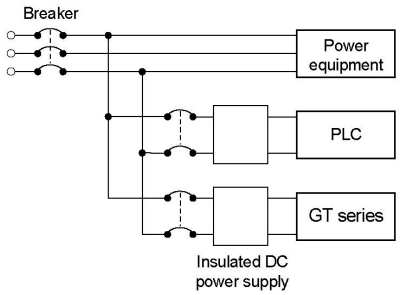
- In order to protect the unit against abnormal voltage from the power supply line, the power supply should be an insulated type, and should be enclosed within a protective circuit.
- A non-insulated requlator is used witht the GT series.
- If a power supply device without an internal protective circuit is being used, power should always be supplied to the GT series through a fuse or a similar protective device.

Keep the power supply voltage within the operating voltage range

Part No.		Operating voltage range
AIGT0030B1/AIGT0030H1 AIGT0032B1/AIGT0032H1 AIGT0130B1/AIGT0130H1 AIGT0132B1/AIGT0132H1 AIGT0230B1/AIGT0230H1 AIGT0232B1/AIGT0132H1		4.5 to 5.5 V DC
AIGT0030B/AIGT0030H AIGT0032B/AIGT0032H AIGT0130B/AIGT0130H AIGT0132B/AIGT0132H AIG05MQ02D/AIG05MQ03D AIG05MQ04D/AIG05MQ05D AIG05GQ02D/AIG05GQ03D AIG05GQ04D/AIG05GQ05D AIG05SQ02D/AIG05SQ03D AIG05SQ04D/AIG05SQ05D AIGT0230B/AIGT0230H AIGT0232B/AIGT0132H AIGT2030B/AIGT2030H AIGT2032B/AIGT2032H	AIGT2130B/AIGT2130H AIGT2132B/AIGT2132H AIGT2230B/AIGT2230H AIGT2232B/AIGT2232H AIGT3100B/AIGT3100H AIGT3300B/AIGT3300H AIG32MQ02D/AIG32MQ03D AIG32MQ04D/AIG32MQ05D AIG32TQ02D/AIG32TQ03D AIG32TQ02D/AIG32TQ03D AIG32TQ04D/AIG32TQ05D AIG32TQ12D/AIG32TQ13D AIG32TQ14D/AIG32TQ15D	21.6 to 26.4 V DC

Keep the power supply wiring separate

- Wiring to the GT series, PLC, and other power equipment should have separate wiring systems.



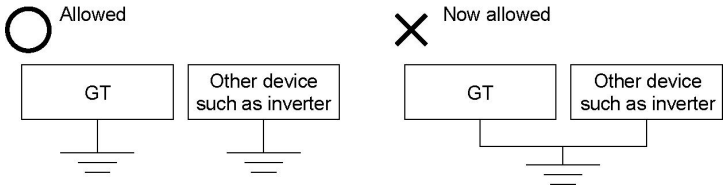
3.2.2 Grounding

Be sure to ground when the influence of noise is great

The unit is tolerant against noise in normal environments, but if the environment is particularly susceptible to noise, please ground.

Use dedicated grounding

- For grounding purposes, use wires with a minimum of 2 mm^2. The grounding connection should have a resistance of less than 100 Ω.
- Make the grounding point as close as possible to the GT and keep the distance of the grounding wire short.
- Sharing the ground with another device may have an adverse effect. Therefore, be sure that grounding is dedicated.

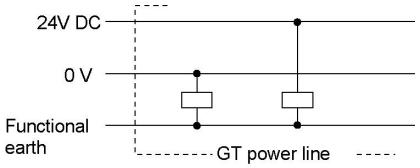


Note:

Conversely, depending on your environment, grounding may cause a problem.

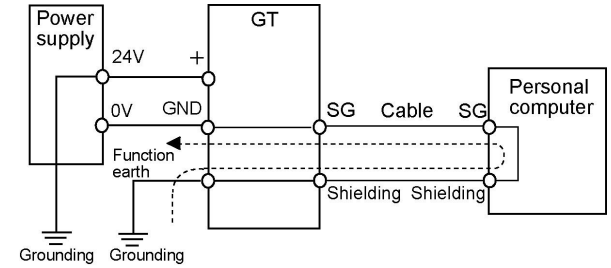
Example:

Since the power line of the GT unit is connected to a functional earth via electronic parts, the electronic parts may become damaged if there is an abnormal potential between the power line and the physical ground.



Do not ground the function earth when grounding a plus (+) terminal of the power. (exclusing GT32 and GT05)

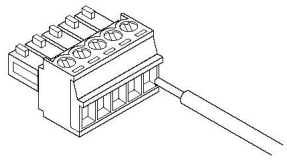
In some computers, the SG terminal of RS232C port and connector shielding are connected. Also the GT01/GT11/GT21/GT30 tool port shielding is connected with the function earth terminal. Therefore, the GND terminal of GT01/GT11/GT21/GT30 and the function earth terminal are connected if the computer is connected. Especially when the GT is connected to a computer with a plus (+) terminal grounded, therefore, an GT's minus (-) terminal is connected with the function earth terminal. As a result, short circuit occurs which may lead to the breakage of GT and its neighboring parts.



3.3 Wiring the COM Port

Accessory communication connector/applicable wiring

The communication connector used for the COM port (provided as an accessory with the main unit) has a screw-tightening type of terminal block. The wiring shown below should be used.



Applicable wiring (twisted wiring)

Size	Conductor cross-section surface area
AWG #28 to 16	0.08 to 1.25 mm^2

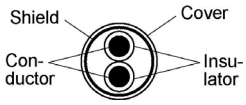
Use a special tool to tighten the terminal block of the communication connector.

Using a screwdriver made by Matsushita Electric Works Co., Ltd. (Product number: AFP0806). The tightening torque should be 0.22 to 0.25 N· m or less.

GT01, GT11, GT21 and GT32: When doing RS485 communication using RS422 type

Please use the following cables or equivalent.

Appropriate electrical cables (twisted cables)

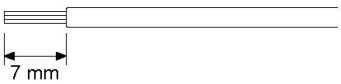
Type	Cross-sectional view	Conductor		Insulator		Cable diam.	Sample appropriate cable
		Size	Resist-ance (at 20°C)	Material	Thick-ness		
Shielded twisted pair		1.25 mm^2 (AWG16) or greater	Max. 16.8 Ω/km	Polye-thylene	Max. 0.5 mm	Approx. 8.5 mm	Belden 9860 Hitachi Cable, Ltd. KPEV-S1.25 mm^2 x 1P
		0.5 mm^2 (AWG20) or greater	Max. 33.4 Ω/km	Polye-thylene	Max. 0.5 mm	Approx. 7.8 mm	Belden 9207 Hitachi Cable, Ltd. KPEV-S0.5 mm^2 x 1P

Note:

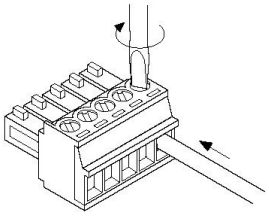
- Use shielded twisted pair cables.
- Use only one type of transmission cable. Do not mix more than 1 type.
- When using shielded cable with crossover wiring for the RS485 transmission line, grounded one end.

Wiring method

(1) Remove the sheath from the wire.



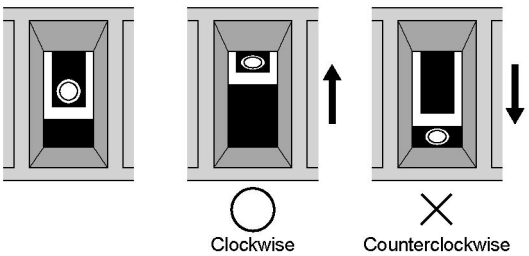
(2) Insert the wire all the way into the terminal block, and tighten the screw in the clockwise direction to secure it.



Precautions concerning wiring

The following precautions should be observed, to avoid broken or disconnected wires.

- When removing the sheath, be careful not to scratch the core wire.
- Wire the terminal without twisting the core wire.
- The core wire should be connected without soldering it. Vibration can sometimes cause soldered connections to break loose.
- After connecting the wiring, avoid subjecting the cable to stress.
- Because of the construction of the terminal, tightenng the wire in the counterclockwise direction will cause a faulty connection. If this happens, disconnect the wire, check the terminal hole, and connect the wire again.



Reference:

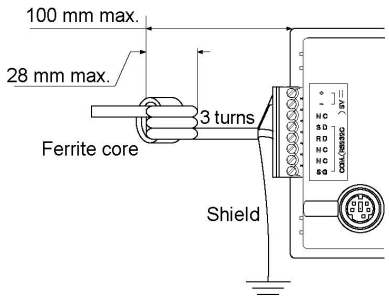
For information on connecting the COM port of the GT series with various PLC units, refer to <Chapter 4 Connecting with the PLC>.

3.4 Precautions when Wiring COM Port

3.4.1 GT01 (5 V DC)

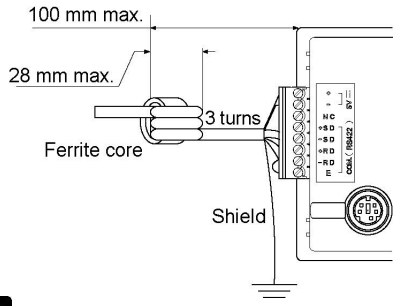
RS232C type

- Perform wiring and placement of the cable so that there is no impression of external noise on the cable and no induction.
- Use shielded wires for distribution cables.
  (Recommended cable: AIGT8142 with one ferrite core)
- It conforms to CE marking. As conditions, the following wiring is required.
  1. Make the cable do three turns around a ferrite core.
     (Recommended ferrite core: Seiwa Electric's E04RA190120080 or equivalent)
  2. Perform grounding of the cable shield.
     * Packaged with AIGT8142.



RS422 (RS485) type

- There is no RS and CS (control lines).
- Perform wiring and placement of the cable so that there is no impression of external noise on the cable and no induction.
- Use shielded wires for distribution cables.
  (Recommended cable: AIGT8152 with one ferrite core(Seiwa Electric's E04RA190120080))
- "E" is used to set the terminating station.
- It does not conform to European EMC directive.



Reference: <3.2.2 Grounding>

Key Point:

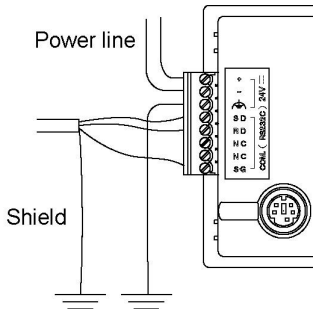
The CE marking standards that the GT01 conforms to (excluding the RS422 (RS485) type)
European EMC directive 89/336/EEC
European EMC standards (EN61000-6-4 and EN61000-6-2)

3.4.2 GT01, GT05, GT11, GT21 and GT32 (24 V DC)

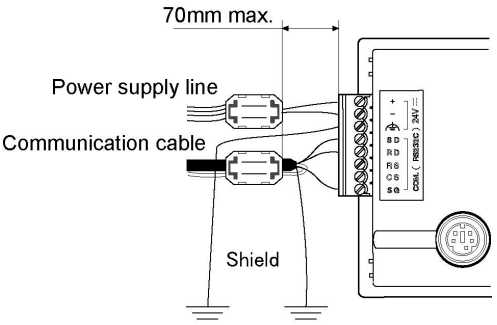
RS232C type

- There is no CS (control lines) for GT01.
- Perform wiring and placement of the cable so that there is no impression of external noise on the cable and no induction.
- Use shielded wires for distribution cables. (Recommended cable: AIGT8162)
- It conforms to CE marking. As conditions, the following wiring is required.
  1. Install a ferrite core to the cable. (For GT11 only)
     (Recommended ferrite core: Seiwa Electric's E04SR170730A or equivalent)
  2. Perform grounding of the cable shield.
  3. Perform grounding of the GT.

GT01

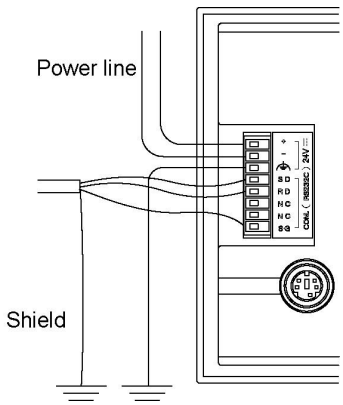


GT11

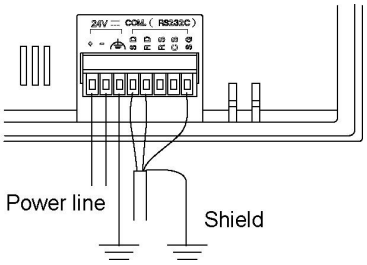


Installing Ferrite core

GT21



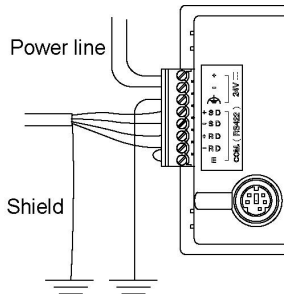
GT05/GT32



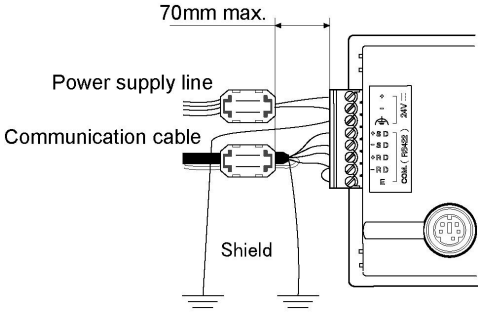
RS422 (RS485) type

- There is no RS and CS (control lines).
- Perform wiring and placement of the cable so that there is no impression of external noise on the cable and no induction.
- Use shielded wires for distribution cables. (Recommended cable: AIGT8175)
- The power supply should be an insulated DC power supply.
- “E” is used to set the terminal unit.
- It conforms to CE marking. As conditions, the following wiring is required.
  1. Fit a ferrite core to the cable. (For GT11 only)
     (Recommended ferrite core: Seiwa Electric’s E04SR170730A or equivalent)
  2. Perform grounding of the cable shield.
- 3. Perform grounding of the GT.

GT01

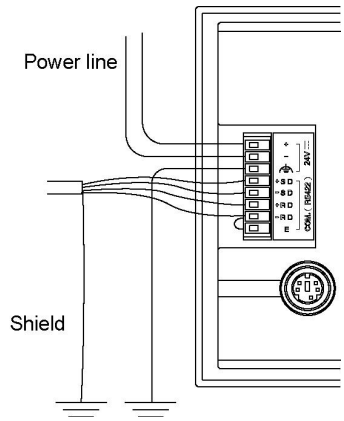


GT11

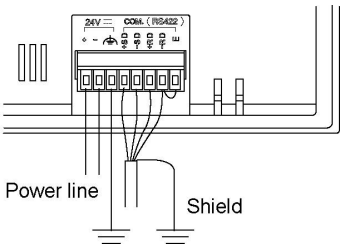


Installing Ferrite core

GT21



GT05/GT32



Reference: <3.2.2 Grounding>

Key Point:

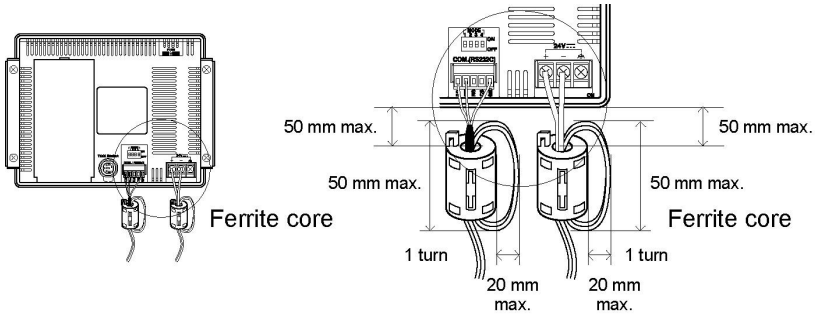
The CE marking standards that the GT series conforms to (excluding the RS422 (RS485) type GT01)

European EMC directive 89/336/EEC

European EMC standards For GT01, GT11, GT21 (EN61000-6-4 and EN61000-6-2)
For GT05, GT32 (EN61131-2)

3.4.3 GT30 (24 V DC)

- When connecting the unit to the FP series, there is no need to wire both the RS and CS.
- Perform wiring and placement of the cable so that there is no impression of external noise on the cable and no induction.
- Use shielded wires for distribution cables. (Recommended cable: AIGT8192)
- It conforms to CE marking. As conditions, the following wiring is required.
    1. A ferrite core should be installed when wiring to the COM por and power supply terminal. When installing make sure that the connection and power cables are not stressed (This could result in broken connections.
    (Recommended ferrite core: Seiwa Electric's E04RS211132 or equivalent)



Reference: <3.2.2 Grounding>

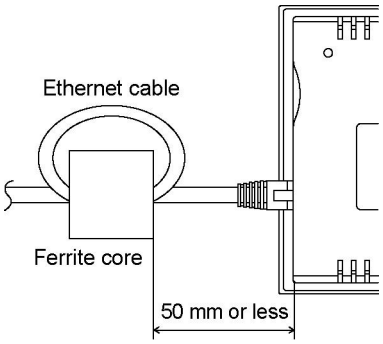
Key Point:

The CE marking standards that the GT30 conforms to
European EMC directive 89/336/EEC
European EMC standards (EN61000-6-4 and EN61000-6-2)

3.5 Precautions when Wiring Ethernet Port (GT32T1)

- Although more than one GT32T1 can be connected using a hub, communication is performed with one unit each. Specify each destination to communicate.
- Use a UTP cable (unshielded cable) for the Ethernet cable, and take measures for noises such as installing a ferrite core if necessary.
- It conforms to CE marking. As conditions, the following wiring is required.
    1. Do nto a shielded wire for the Ethernet cable.
    2. Install a ferrite core to the Ethernet cable.
       (Recommended ferrite core: Kitagawa Indsutries' SFC-10 or equivalent)
    1. Make the cable do one turns around a ferrite core.

GT32T1



Key Point:
The CE marking standards that the GT32 conforms to
European EMC directive 89/336/EEC
European EMC standards (EN61131-2)

3.6 Options

3.6.1 Backup Battery

Backup battery

The internal data in the GT can be backed up using the backup battery.
Use the following backup batteries.

GT model	Battery type	Product No.
GT11	Button type lithium battery	CR2032 (commercial item)
GT21		
GT30		
GT32	Backup battery	AFPX-BATT (The backup battery for the FP-X is used.)
GT05		

Battery life

Battery life, when operating at a normal temperature (25°C), a normal humidity (65% RH), and a voltage of 24 V DC, is as follows.

GT model	life
GT11	Approx. 2 years
GT21	
GT30	
GT32M	Approx. 5 years
GT32T *	Approx. 3 years
GT05S	Approx. 3 years
GT05M	Approx. 5 years
GT05G	

Backup

The internal data of the GT is backed up in the following ways.

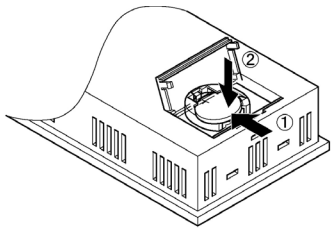
Internal data to be backed up	Stored in	Backup battery
Hold PLC Device data Clock data GT internal device hold data Alarm history data	Stored in the SRAM.	Required
Screen data GT configuration data	Stored in the F-ROM.	Not requred

Note:

When using a backup battery, attach the battery before the power supply is turned on.

3.6.2 How to Install the Battery (GT11 and GT21)

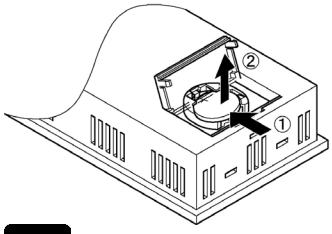
(The figures below is explained using the GT11. Although the design of the GT21 is different, the procedure is the same.)



When installing the battery

①Insert the head of the battery in the battery holder, and push it into the back.

②Press the battery down pushing it into the back of the battery holder.



When removing the battery

①Push the battery into the back of the holder.

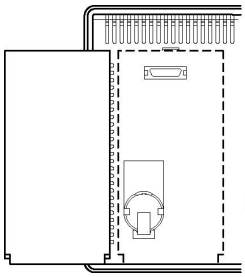
②Pull up the battery pushing it into the back of the battery holder.

Note: Do not touch the electronic parts when removing and installing the battery.

3.6.3 How to Install the Battery (GT30)

A battery is installed in the GT30.

In order to prevent the battery from discharging, an insulation sheet is inserted.
Before turning on the power, always remove the insulating sheet.



Remove insulation sheet.

When removing the battery

(1) Push up the battery using an insulated slotted screwdriver.
(2) Push out the battery having the right and left metal parts of the battery holder in your hand, and remove it.

When installing the battery

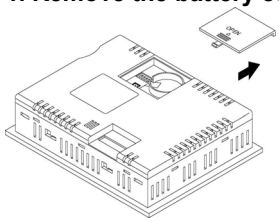
(1) Insert the head of the batter in the battery holder with the positive pole side up, and push it into the back.
(2) Push it into the back until it is settled in the battery holder horizontally.

Note: Do not touch the electronic parts when removing and installing the battery.

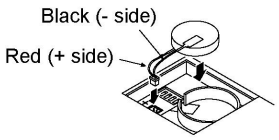
3.6.4 How to Install the Battery (GT32 and GT05)

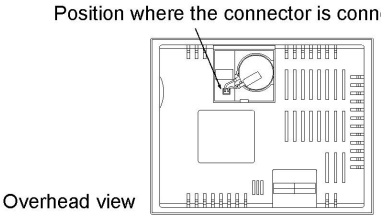
The figures below is explained using the GT32. Although the design of the GT05 is different, the procedure is the same.

1. Remove the battery cover.

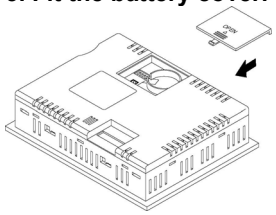


2. Connect the connector to make the red line be the (+) side, and place a battery in the circular frame.





3. Fit the battery cover.



3.6.5 Dead Battery Mark

If the battery voltage drops too low, the battery mark is displayed at the bottom right of the GT screen.

Model	When the battey voltage drops
GT11, GT21, GT32, GT05	
GT30	

It can be specified in the GTWIN configuration settings, whether or not the dead batteyr mark is displayed .

Reference: <5.2.6 Setup>

Note:

If the battery voltage drops too low, the BAT LOW flag of the basic communication area map goes on. If the battery has run down completely, the BAT flag of the basic communi cation area map goes on. Please be aware that the BAT flag goes on the first time that the power supply is turned on after the unit is purchased.

* The BAT and BAT LOW flags in the basic communication area map activate in the both cases that the battery error display is set to “On” and “Off”.

Reference: <5.5 Setting the Basic Communication Area Between the GT and PLC>

3.6.6 Time for Replacement of Battery

When replacing the backup battery, turn on electricity for the time for energization, and replace the battery with a new one within one minute after turning off the power supply.
If the battery is not replced within the time for replacement, the saved data will be lost.

GT model	Time for energization	Time for replacment
GT05, GT11, GT21, GT30	1 minute or more	Within 1 minute
GT32	10 minutes or more	

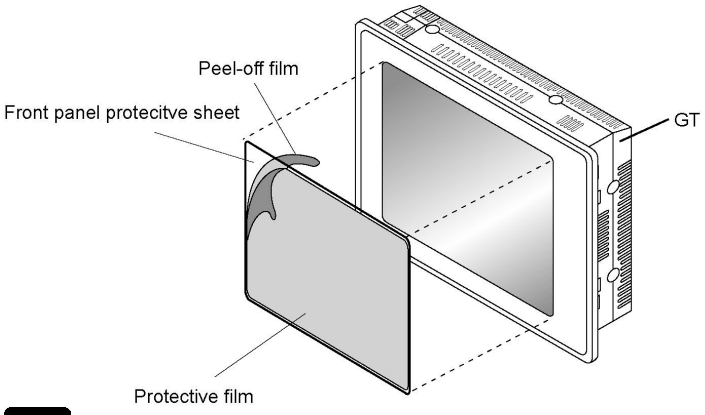
3.6.7 Replacement of Front Panel Protective Sheet

About the front panel protective sheet
Use the following separately-sold protective sheets to protect the touch panel surface and to keep it clean.

Product name	Contents	Product number
Front panel protective sheet	Front panel protective sheet (set of 10, for GT01)	AIGT080
	Front panel protective sheet (set of 10, for GT01R)	AIGT080R
	Front panel protective sheet (set of 10, for GT05)	AIG05800
	Front panel protective sheet (set of 10, for GT11)	AGIT280
	Front panel protective sheet (set of 10, for GT21)	AIGT28021
	Front panel protective sheet (set of 10, for GT30)	AIGT380
	Front panel protective sheet (set of 10, for GT32)	AIG32800

Replacing the front panel protective sheet (For GT01, GT11 and GT30)
Follow the steps below to replace the sheet:

1. Peel off the seal from the provided protector sheet and attach it to the unit.
Take out one of the replacement front panel protective sheets and peel off the seal with the shiny side. When attaching the sheet, align the adhesive edges with the front of the GT. Finish by peeling off the thin film attached to the top of the front panel protective sheet.

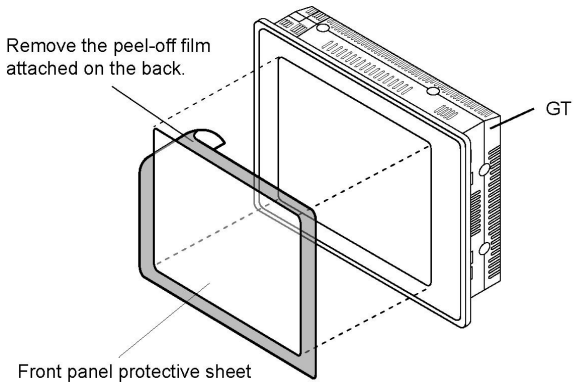


Note:
For GT30
The front panel protective sheet is attached on the GT30 before shipment.
Remove the sheet before replacing it.

Replacing the front panel protective sheet (For GT01R, GT05, GT21 and GT32)

1. Remove the peel-off filme attached to the front panel protective sheet.

2. Attach the front panel protective sheet.
Attach the front sheet to fit the liquid crystal part of GT. At this time, try not to allow the air to get in the attached face. If the air was in, remove the air to be out with fingers. Do not press the front panel hard as it may cause the damage to the touch switch.



3.6.8 About the Waterproof Packing

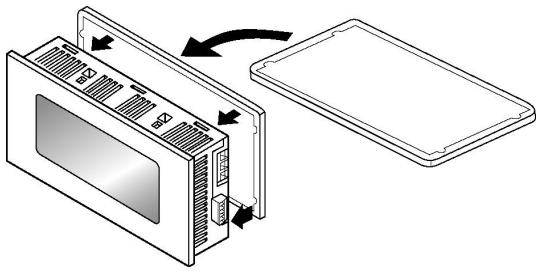
About the waterproof packing
If the panel is being detached from the GT and then reattached, the waterproof packing should be replaced, in order to assure that the panel remains waterproof (IP65).

Product name	Contents	Product number
Waterproof packing	Waterproof packings for replacement (set of 10, for GT01)	AIGT081
	Waterproof packings for replacement (set of 10, for GT05)	AIG05810
	Waterproof packings for replacement (set of 10, for GT11)	AGIT181
	Waterproof packings for replacement (set of 10, for GT21)	AIGT28121
	Waterproof packings for replacement (set of 10, for GT30)	AIGT381
	Waterproof packings for replacement (set of 10, for GT32)	AIG32810

Replacing the waterproof packing

1. Remove the currently attached waterproof packing.
Remove the attached waterproof packing from the GT.

2. Attach the provided waterproof packing.
Take out one of the replacement waterproof packing pieces and attach the outer edge as shown in the illustration (do not use the inner edge).
When doing this, fasten it to the front frame, being sure not to twist the waterproof packing.



3.6.9 Replacing the Backlight (Sold Separately) (Applies Only to GT30)

About the backlight

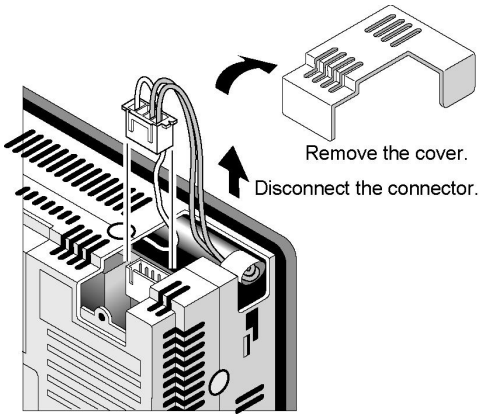
The average service life of the GT30 backlight is 50,000 hours (at room temperature, normal humidity, and 24 V DC). (“Service life” refers to the period over which the brightness diminishes by half, and does not mean that the backlight no longer lights at all.) If the backlight has become dim, it should be replaced with a replacement backlight (sold separately).

Product name	Contents	Product number
Replacement backlight	For color and monochrome LCD types	AIGT382

Replacing the backlight

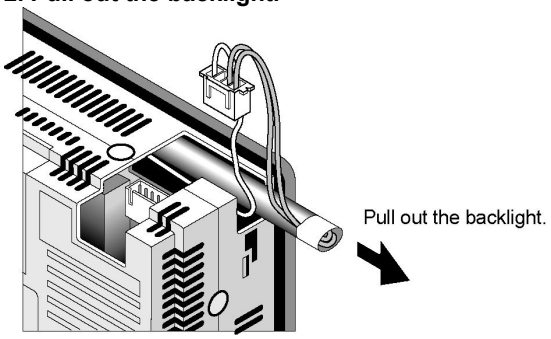
When replacing the backlight, always turn off the power supply to the GT30, and then refer to the procedure outlined below.

1. Take off the cover and disconnect the connector.



Remove the cover, and pull out the connector in the upward direction, as shown in the illustration.

2. Pull out the backlight.



Gently pull out the backlight.
To install the new backlight, reverse the procedure.
*After replacing the backlight, be careful that the backlight cable is not pinched by the case, cutting through it.

Note:

When replacing the backlight, always turn off the power supply to the main unit. Also, we recommend wearing gloves when doing this, to prevent injuries.

Chapter 4

Connecting with PLC

4.1 Electric Supply from PLC (5 V DC type GT01)

The power can be supplied to the 5V DC type GT01 with the communication cable only. The power supply is not required separately. However, it is available only when it is connected with the TOOL port.

Restriction on the capacity of the power supply depending on the PLC model to be used
The number of PLC units that can be expanded is limited.

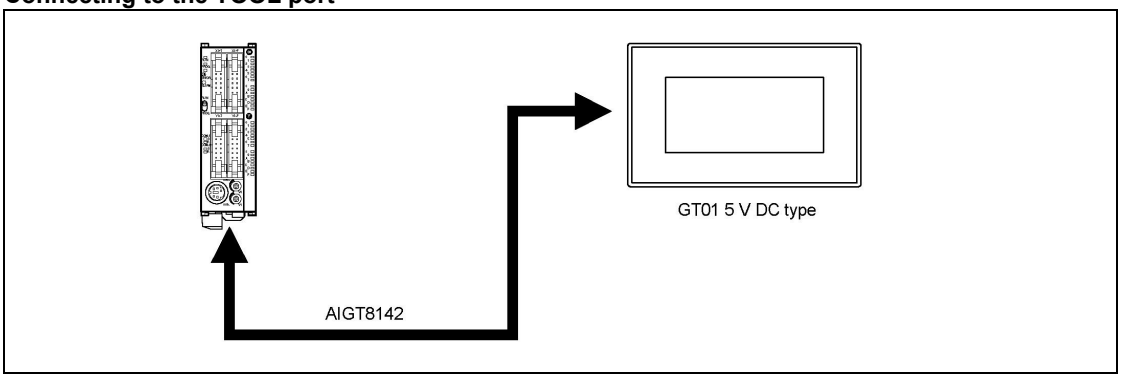
PLC model	Restrictions when connecting a 5 V DC type GT01
FP-X	The number of units which can be expanded depends on the unit type.
FP0	Maximum of two expansion units *
FPΣ	Maximum of six expansion units *
FP2	The method for calculating the number of units that can be expanded is provided in the manual. Follow that formula and keep the GT01's power consumption noghigher than 200 mA when calculating.
FP2SH	
FP-e	There are no particular restrictions.
FX series made by Mitsubishi Electric Co.	The restrictions are equivalent to the restrictions on the programmable display F920 (5 V power supply type) made by Mitsubishi. Use the FX seires according to the use conditions for the F920 (5 V power supply type).

* Expansion is possible with the number of units given above, regardless of the type of unit.

Reference: <FP-X User's Manual ARCT1F409E>
<FP2/FP2SH User's Manual ARCT1F302E>

4.1.1 Connection Between FP-X/FPΣ/FP0/FP-e and 5 V DC type GT01

Connecting to the TOOL port



PLC	PLC communication cable		Programmable display		
FP-X FPΣ FP0 FP-e	Mini-DIN 5-pin loose-wire cable	AIGT8142	GT01	5 V DC type	AIGT0*30B1 AIGT0*30H1

Communication format settings

System register No.	Item	Value set
410	TOOL port unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
414	TOOL port Baud rate setting	9600 bps

Connecting to the TOOL port

PLC side

Pin No.	Signal name
1	SG
2	SD
3	RD
4	—
5	+5V

GT side (RS232C)

Pin No.	Signal name
1	+
2	—
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

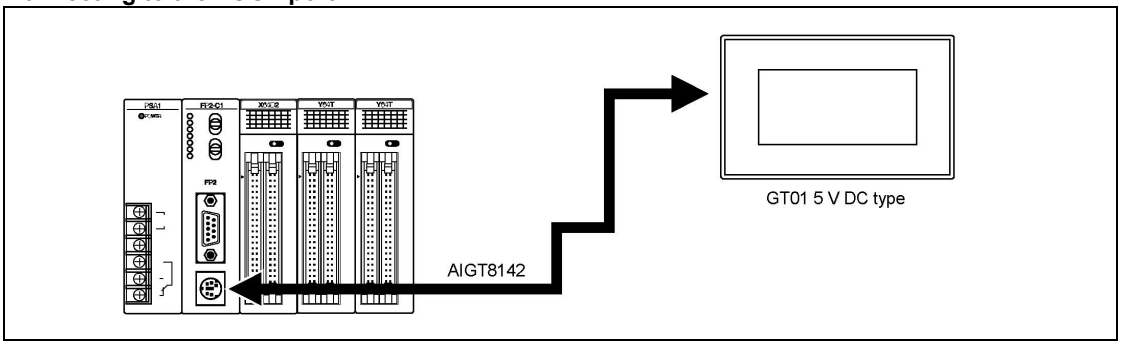
Reference: <4.7.3 How to Make Communication Settings Using the FPWIN GR>

Note: Connecting to the COM port is not available.

- Keep the cable no longer than 3 m.
- In case of connecting to PLC with all expansion slots used, prepare an external 5 V DC power supply for the GT01 due to current consumption limits.

4.1.2 Connection Between FP2/FP2SH and 5 V DC type GT01

Connecting to the TOOL port



PLC	PLC communication cable		Programmable display		
FP2 FP2SH	Mini-DIN 5-pin loose-wire cable	AIGT8142	GT01	5 V DC type	AIGT0*30B1 AIGT0*30H1

Communication format settings

System register No.	Item	Value set
410	Unit number	1
411	Data length	8 bits
414	Baud rate setting	9600 bps

Connecting to the TOOL port

PLC side

Pin No.	Signal name
1	SG
2	SD
3	RD
4	—
5	+5V

GT side (RS232C)

Pin No.	Signal name
1	+
2	—
3	NC
4	SD
5	RD
6	NC
7	NC
8	SG

Reference: <4.7.3 How to Make Communication Settings Using the FPWIN GR>

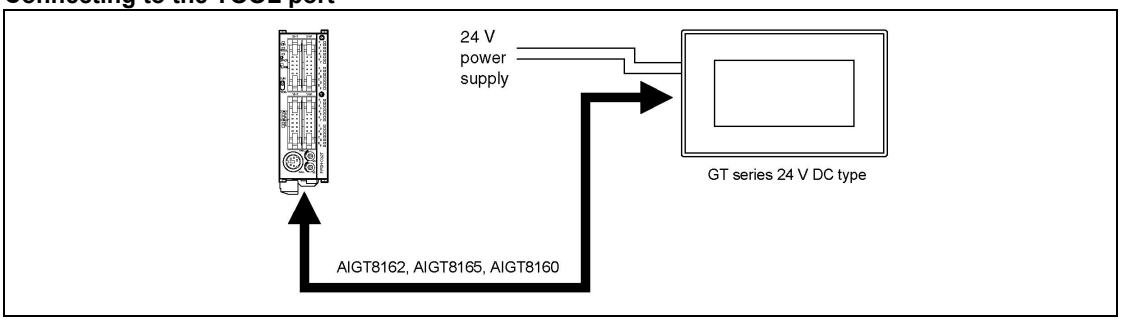
Note: Connecting to the COM port is not available.

- Keep the cable no longer than 3 m.
- In case of connecting to PLC with all expansion slots used, prepare an external 5 V DC power supply for the GT01 due to current consumption limits.

4.2 Connection Method Between GT01/GT05/GT11/GT21/GT32 and PLCs

4.2.1 Connecting to the TOOL Port of FP-X/FPΣ/FP0/FP-e

Connecting to the TOOL port

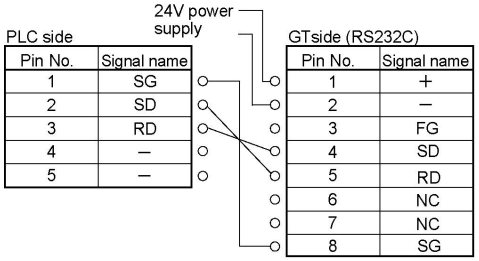


PLC	PLC communication cable		Programmable display		
FP-X FPΣ FP0 FP-e	Mini-DIN 5-pin loose-wire cable	AIGT8162 AIGT8165 AIGT8160	GT01	24 V DC type	AIGT0*30B AIGT0*30H
			GT11		AIGT2030* AIGT2130*
			GT21		AIGT2230B AIGT2230H
			GT32		AIG32*Q*2D AIG32*Q*3D
			GT05		AIG05*Q*2D AIG05*Q*3D

Communication format settings

System register No.	Item	Value set
410	TOOL port unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
414	TOOL port Baud rate setting	9600 bps

Connecting to the TOOL port

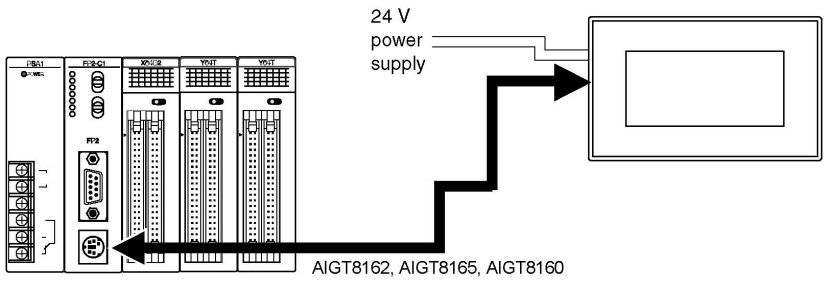


※ Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

Reference: <4.7.3 How to Make Communication Settings Using the FPWIN GR>

4.2.2 Connecting to the TOOL Port of FP2/FP2SH e

Connecting to the TOOL port

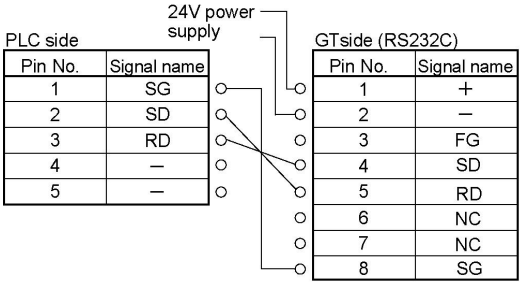


PLC	PLC communication cable		Programmable display		
FP2 FP2SH	Mini-DIN 5-pin loose-wire cable	AIGT8162 AIGT8165 AIGT8160	GT01	24 V DC type	AIGT0*30B AIGT0*30H
			GT11		AIGT2030* AIGT2130*
			GT21		AIGT2230B AIGT2230H
			GT32		AIG32*Q*2D AIG32*Q*3D
			GT05		AIG05*Q*2D AiG05*Q*3D

Communication format settings

System register No.	Item	Value set
410	TOOL port unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
414	TOOL port Baud rate setting	9600 bps

Connecting to the TOOL port

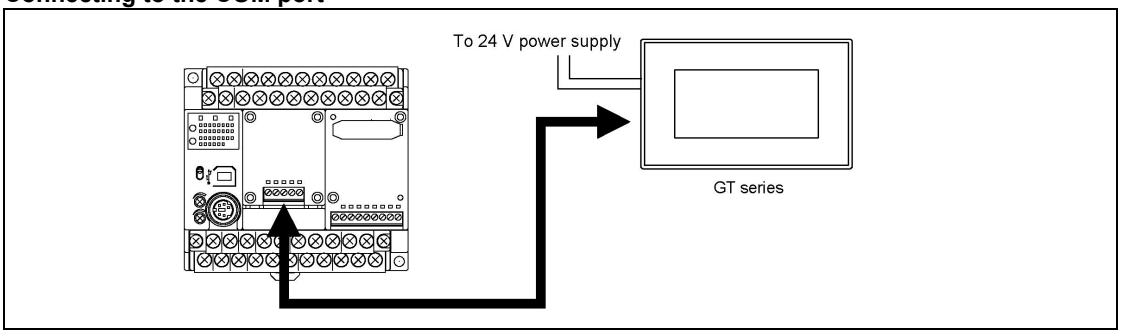


※ Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

Reference: <4.7.3 How to Make Communication Settings Using the FPWIN GR>

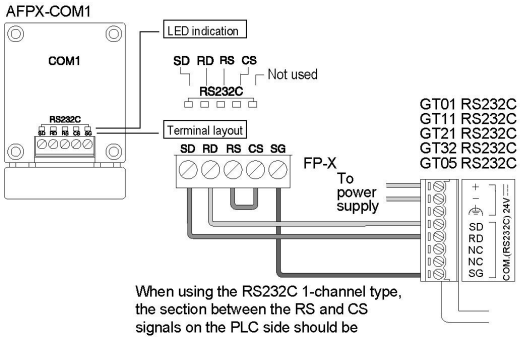
4.2.3 Connecting to the COM Port of FP-X

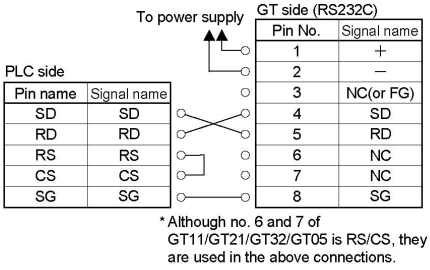
Connecting to the COM port



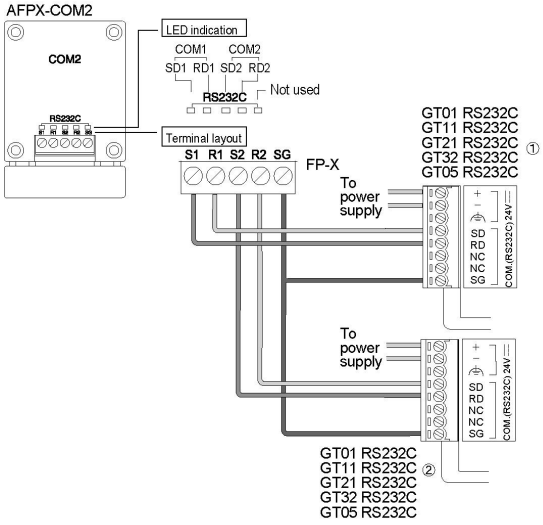
PLC	PLC communication cable	Programmable display	
FP-X	Loose-wire cable	GT01	AIGT0*3**
		GT11	AIGT203** AIGT213**
		GT21	AIGT223**
		GT32	AIG32TQ0*D
		GT05	AIG05*Q0*D

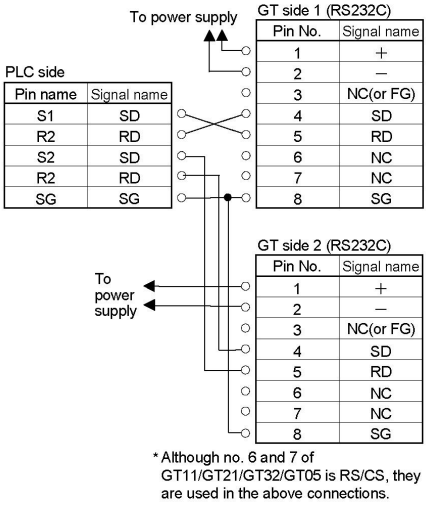
Connecting to the 1- channel RS232C Type





Connecting to the 2-channel RS232C Type

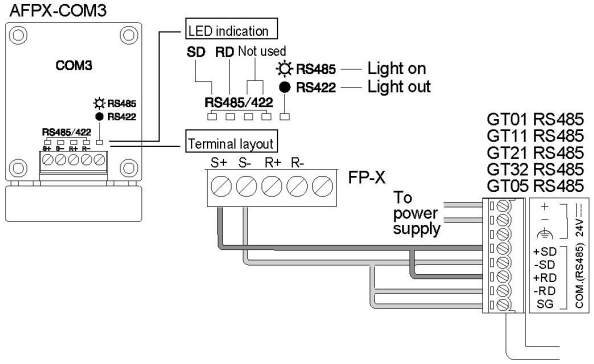




Connecting to the 1-channel RS485/RS422 Type

It is selectable either RS485 or RS422.

Using RS485



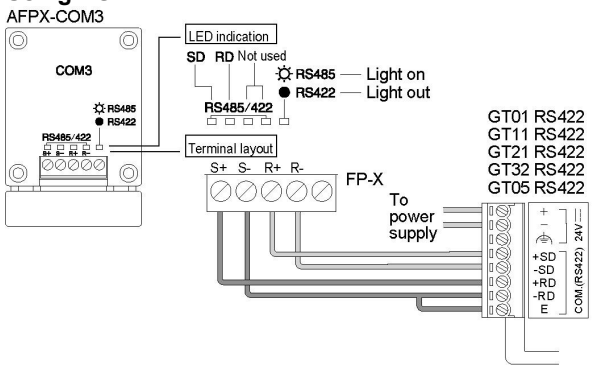
To power supply

PLC side	
Pin name	Signal name
S+	S+
S-	S-
Not used	
Not used	
Not used	

GT side (RS485)	
Pin No.	Signal name
1	+
2	–
3	NC(or FG)
4	+SD
5	-SD
6	+RD
7	-RD
8	E

* Turns on No.1 to No.4 of the switch at the back of the cassette.

Using RS422



To power supply

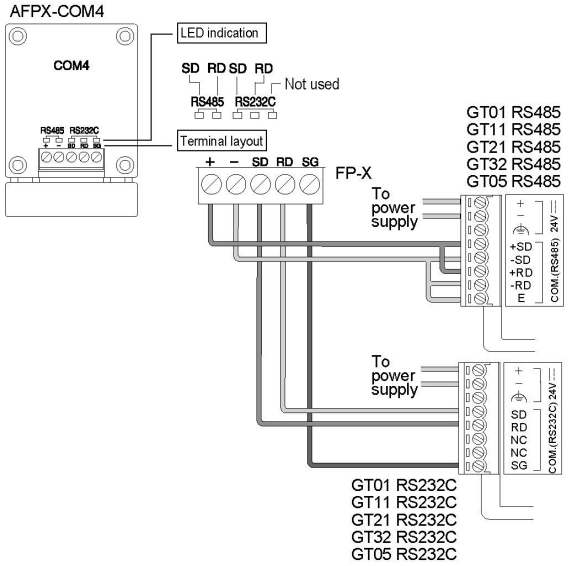
PLC side	
Pin name	Signal name
S+	SD+
S-	SD-
R+	RD+
R-	RD-
Not used	

GT side (RS422)	
Pin No.	Signal name
1	+
2	–
3	NC(or FG)
4	+SD
5	-SD
6	+RD
7	-RD
8	E

* Turns off No.1 to No.3 of the switch at the back of the cassette, and turn on No.4.

Connecting to the 1-channel RS485 and 1-channel RS232C combination

The connections with either one unit or two units are available.



To power supply

PLC side

Pin name	Signal name
S+	+
S-	-
SD	SD
RD	RD
SG	SG

* Turn on the switch at the back of the cassette.

GT side (RS485)	
Pin No.	Signal name
1	+
2	–
3	NC(or FG)
4	+SD
5	-SD
6	+RD
7	-RD
8	E

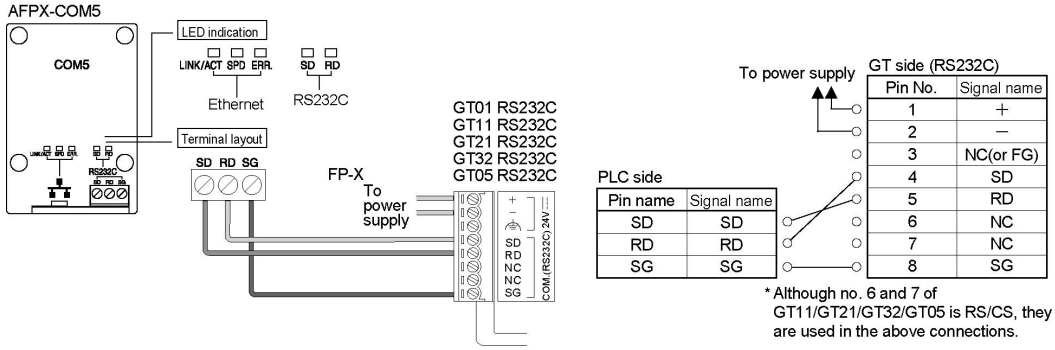
To power supply

GT side (RS232C)	
Pin No.	Signal name
1	+
2	–
3	NC(or FG)
4	SD
5	RD
6	NC
7	NC
8	SG

* Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

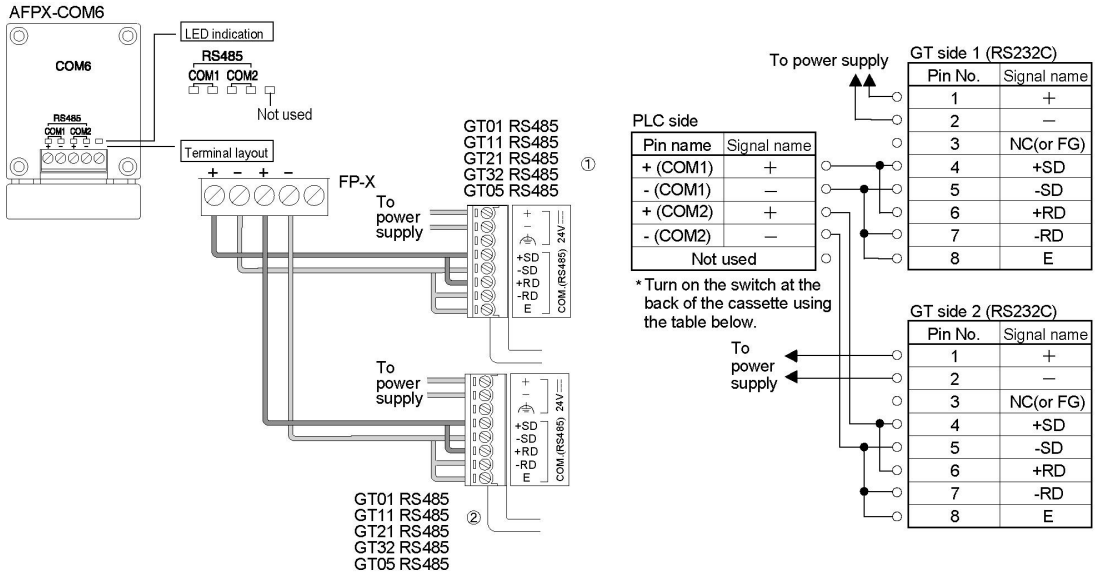
Connecting to the 1-channel Ethernet and 1-channel RS232C combination

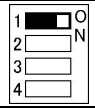
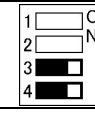
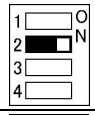
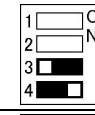
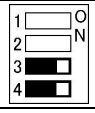
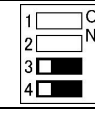
It cannot be connected with Ethernet.



Connecting to the 2-channel RS485

The connections with either one unit or two units are available.

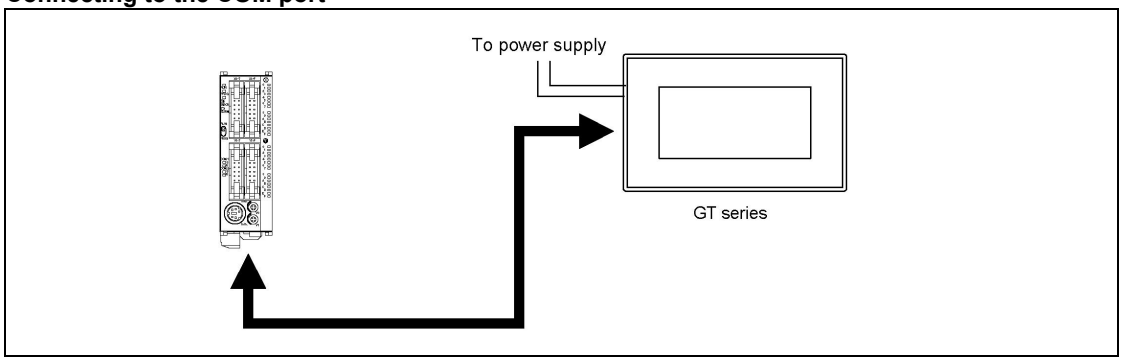


Setting	Terminal unit/Baud rate *	Setting	Terminal unit/Baud rate *
	When COM1 is terminal unit		115200bps
	When COM2 is terminal unit		19200bps
	115200bps		9600bps

Reference: < FP-X User's Manual ARCT1F409E>
For the information on the connection with RS485, refer to <4.2.10 Precautions When Communicating With RS485>

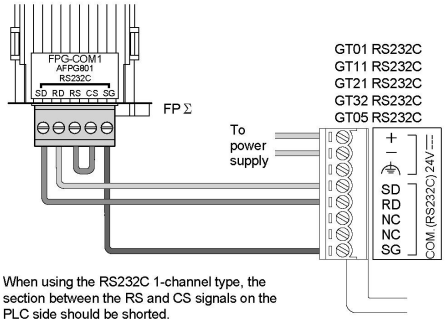
4.2.4 Connecting to the COM Port of FPΣ

Connecting to the COM port



PLC	PLC communication cable	Programmable display	
FPΣ	Loose-wire cable	GT01	AIGT0*3**
		GT11	AIGT203** AIGT213**
		GT21	AIGT223**
		GT32	AIG32*Q0*D
		GT05	AIG05*Q0*D

Connecting to the COM1 and COM2 cassettes of FPΣ
Connecting to the COM port of FPΣ



When using the RS232C 1-channel type, the section between the RS and CS signals on the PLC side should be shorted.

When using the RS232C 1-channel type (AFPG801)

PLC side			GT side (RS232C)	
Pin name	Signal name		Pin No.	Signal name
		To 24 V power supply	1	+
			2	–
			3	FG
SD	SD		4	SD
RD	RD		5	RD
RS	RS		6	NC
CS	CS		7	NC
SG	SG		8	SG

When using the RS232C 2-channel type(AFPG802)

PLC side			GT side (RS232C)	
Pin name	Signal name		Pin No.	Signal name
		To 24 V power supply	1	+
			2	–
			3	FG
SD	SD		4	SD
RD	RD		5	RD
RS	SD		6	NC
CS	RD		7	NC
SG	SG		8	SG

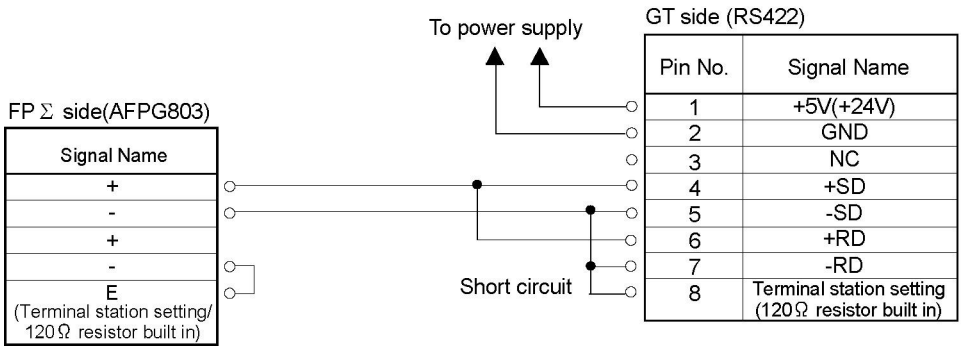
* Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

Connecting to the COM3 cassette of FPΣ
FPΣ Communication format setting

Item	Value set
COM port 1 unit number	No. 1
COM port 1 communication mode	Computer link
COM port 1 transfer format	8 bits, odd, 1 stop, terminal CR (fixed), no STX
COM port 1 baud rate setting	38400 bps, 57600 bps, 115200 bps

Note) Use a baud rate of 38400 bps or higher.

Reference: <4.1.12 How to Make Communication Settings Using the FPWIN GR>

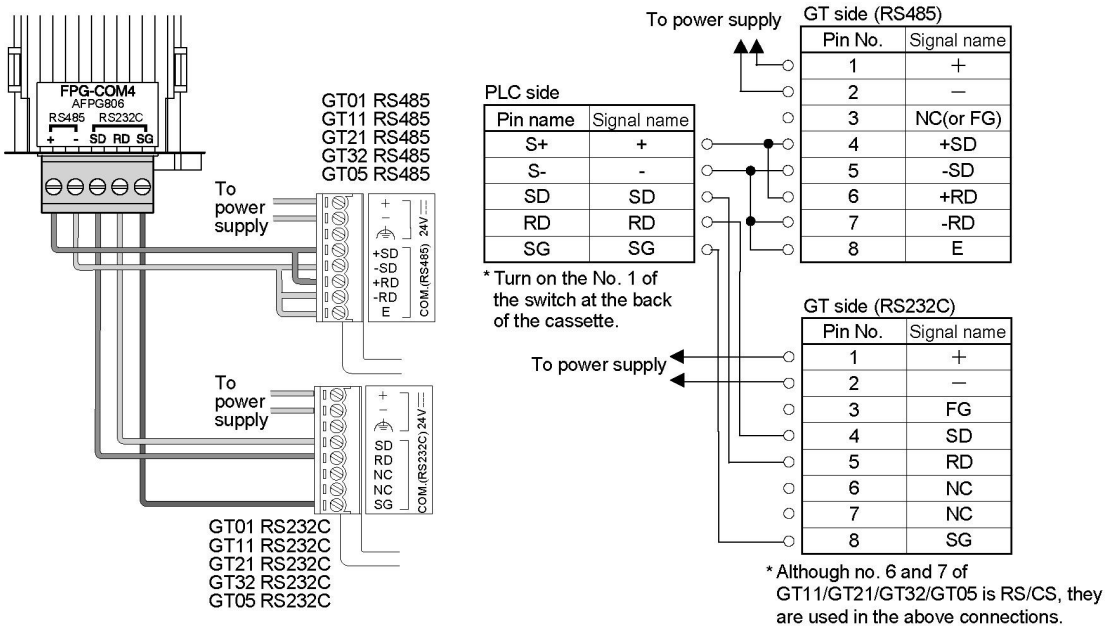


Note:

- Use with 1:1.
- If noise is a problem, use a shielded cable and employ countermeasures such as installing a ferrite core if necessary.
- The transferdistance is 30 m maximum. (Up to 500 m is possible with the 24 V type).

Connecting to the COM4 cassette of FPΣ

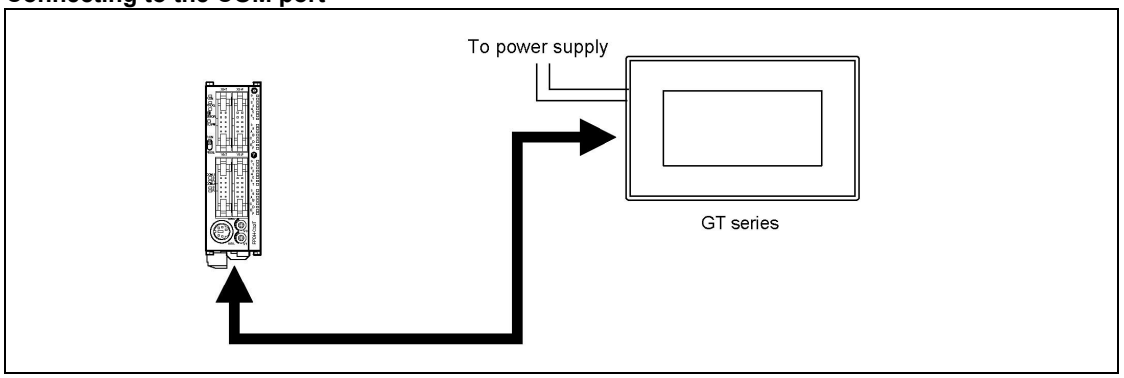
The connections with either one unit or two units are available.



Reference: For the information on the connection with RS485, refer to <4.2.10 Precautions When Communicating With RS485>

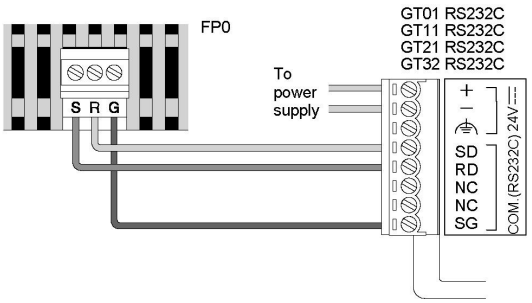
4.2.5 Connecting to the COM Port of FP0

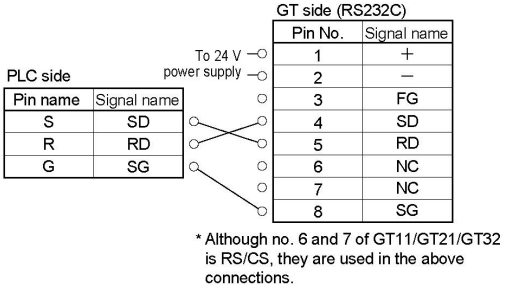
Connecting to the COM port



PLC	PLC communication cable	Programmable display	
FP0	Loose-wire cable	GT01	AIGT0*3**
		GT11	AIGT203** AIGT213**
		GT21	AIGT223**
		GT32	AIG32*Q**D

Connecting to the COM port of FP0

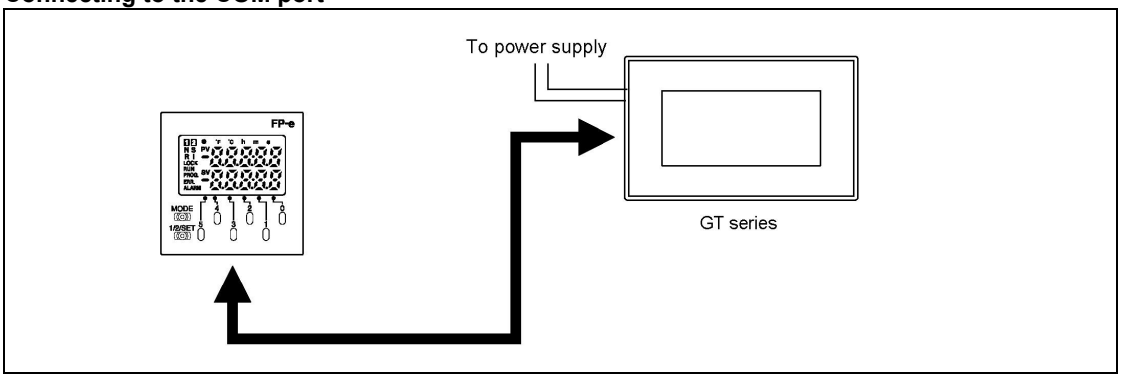




* Although no. 6 and 7 of GT11/GT21/GT32 is RS/CS, they are used in the above connections.

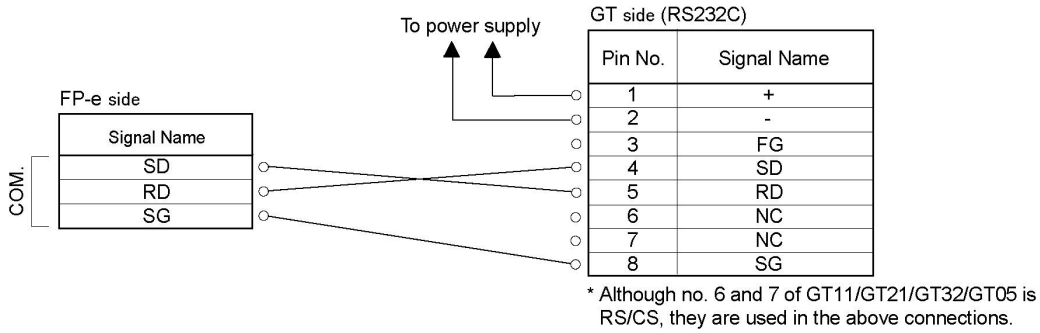
4.2.6 Connecting to the COM Port of FP-e

Connecting to the COM port



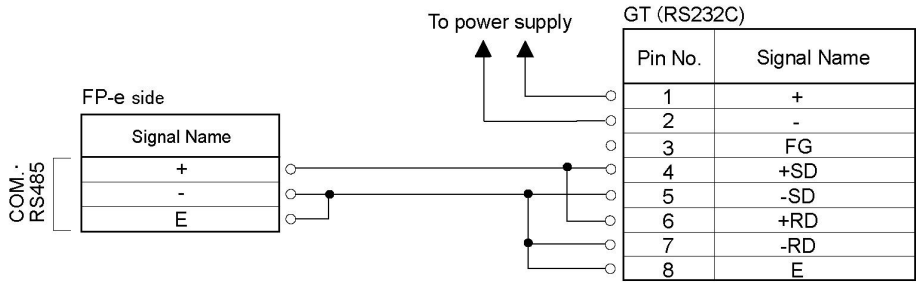
PLC	PLC communication cable	Programmable display	
FP-e	Loose-wire cable	GT01	AIGT0*3**
		GT11	AIGT203** AIGT213**
		GT21	AIGT223**
		GT32	AIG32TQ0*D
		GT05	AIG05*Q0*D

Connecting to the FP-e (RS232C)



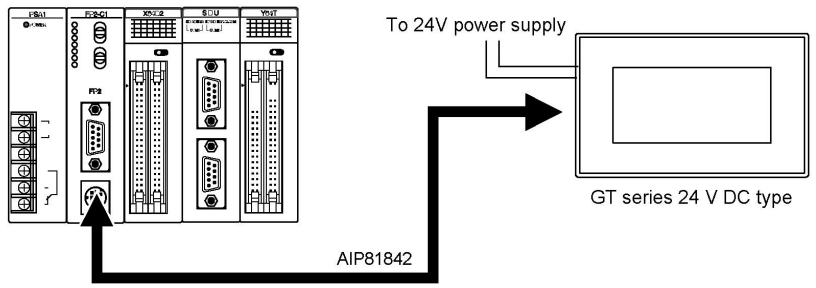
* Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

Connecting to the FP-e (RS485)



4.2.7 Connecting to the COM Port of FP2/FP2SH

Connecting to the TOOL port

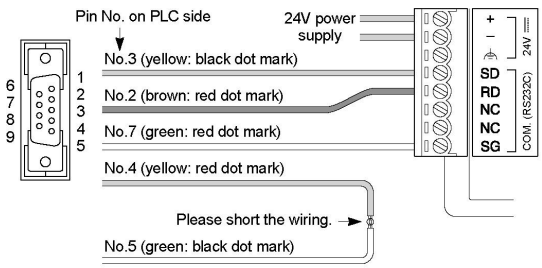


PLC	PLC communication cable		Programmable display		
FP2 FP2SH	D-SUB 9-pin loose-wire cable	AIP81842	GT01	24 V DC type	AIGT0*30B AIGT0*30H
			GT11		AIGT2030* AIGT2130*
			GT21		AIGT2230B AIGT2230H
			GT32		AIG32*Q*2D AIG32*Q*3D
			GT05		AIG05*Q*2D AIG05*Q*3D

Communication format settings

System register No.	Item	Value set	System regsiter value
412	Selection of application of RS232C	Computer link	K1
413	Data length	8 bits	K3
	Parity check	Yes, Odd	
	Stop bits	1 bit	
	End code	CR (Fixed)	
	Start code	No STX (Fixed)	
414	TOOL port Baud rate setting	9600 bps	K1
415	Unit number	1	K1
416	Modem connection	No connection	H0

Connecting to the COM port



PLC side

Pin No.	Signal name
1	FG
2	SD
3	RD
4	RS
5	CS
6	N.C.
7	SG
8	N.C.
9	ER

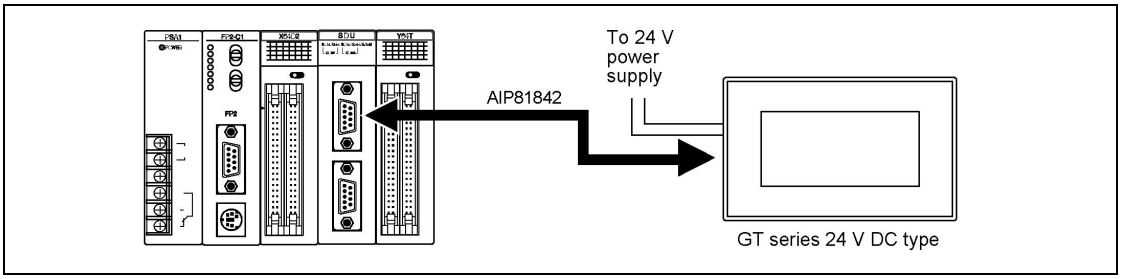
To 24V power supply

GT side (RS232C)

Pin No.	Signal name
1	+
2	-
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

*Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

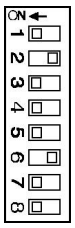
4.2.8 Connecting to FP2 Computer Communication Unit



PLC	PLC communication cable		Programmable display		
FP2 FP2SH	D-SUB 9-pin loose-wire cable	AIP81842	GT01	24 V DC type	AIGT0*30B AIGT0*30H
			GT11		AIGT2030* AIGT2130*
			GT21		AIGT2230B AIGT2230H
			GT32		AIG32*Q*2D AIG32*Q*3D
			GT05		AIG05*Q*2D AIG05*Q*3D

DIP switch settings on the backside of FP2 computer communication unit

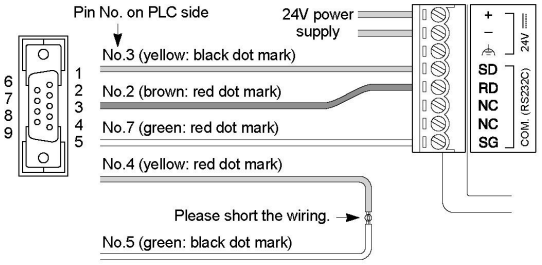
SW No.	Setting contents	Value set	Switch status
1	Reserved for system		ON
2	COM1 baud rate	9600 bps	OFF
3			ON
4	COM1 data length	8 bits	ON
5	Reserved for system		ON
6	COM2 baud rate	9600 bps	OFF
7			ON
8	COM2 data length	8 bits	ON



* If both serial ports of the FP2 computer communication unit are being used, each port should be set individually as shown at theleft.

With the FP2 CCU, the parity check is fixed at “Odd”, and the number of stop bits is fixed at “1 bit”.

Connecting to the FP2 computer communication unit (CCU)



PLC side

Pin No.	Signal name
1	FG
2	SD
3	RD
4	RS
5	CS
6	N.C.
7	SG
8	N.C.
9	ER

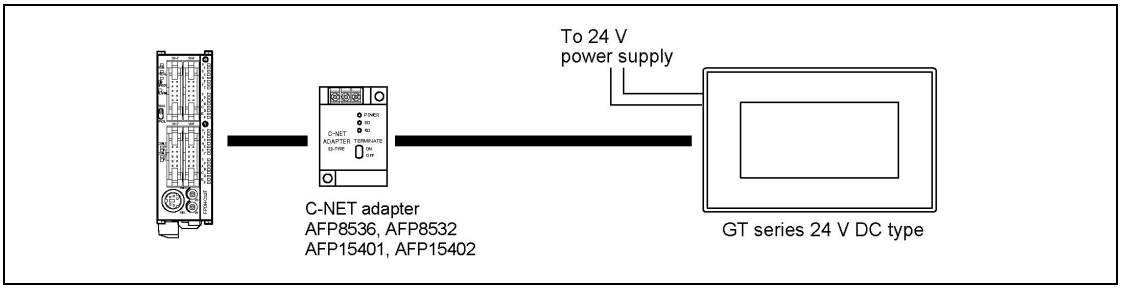
To 24V power supply

GT side (RS232C)

Pin No.	Signal name
1	+
2	-
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

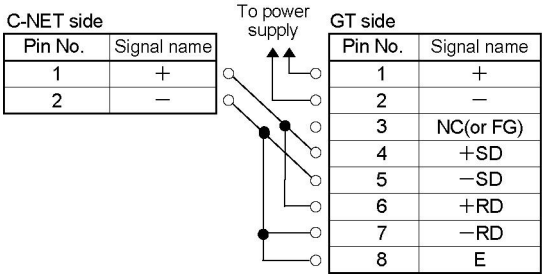
* Although no. 6 and 7 of GT11/GT21/GT32/GT05 is RS/CS, they are used in the above connections.

4.2.9 Connecting to C-NET ADAPTER



PLC	PLC communication cable		Programmable display		
FP series	C-NET adapter	AFP8536 AFP8532 AFP15401 AFP15402	GT01	24 V DC type	AIGT0*30B AIGT0*30H
			GT11		AIGT2030* AIGT2130*
			GT21		AIGT2230B AIGT2230H
			GT32		AIG32*Q*2D AIG32*Q*3D
			GT05		AIG05*Q*2D AIG05*Q*3D

Conneciton method



Setting the communication conditions

Gt communication settings (Set with the GTWIN configuration settings.)

Item	Value set
Baud rate	19200bps
Data length	8 bits
Parity check	1 bit
Stop bit	Odd

Communication settings on the PLC side

Specify the setting to match with the setting for the GT using the tool software at the PLC side.

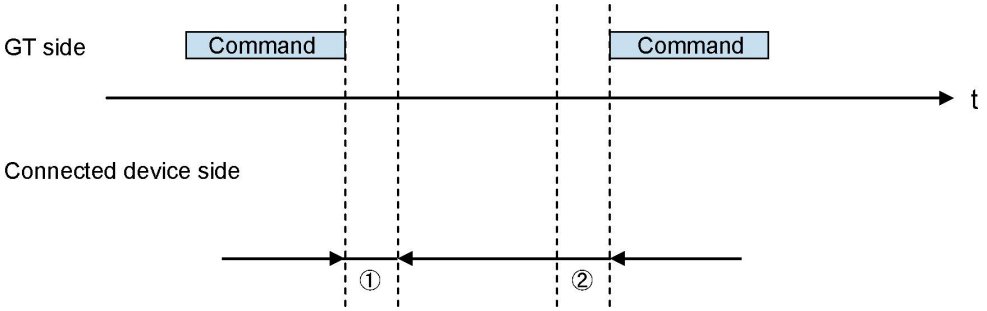
Reference: <4.1.12 How to Make Communication Settings Using the FPWIN GR and FPWIN Pro Troubleshooting>

C-NET adapter setting

Set the termination (TERMINATE) to on.

4.2.10 Precautions When Communicating With RS485

When communication with the RS485, the transmission line for sending and receiving data is the same.



① **Time taken until the connected device sends a response after sending a command from the GT:**

If a response is sent too quickly, the GT may not be able to receive it. Adjust the time if necessary.
For our FP series FPΣ or FP-X, the time can be speicifed using the SYS1 instruction.

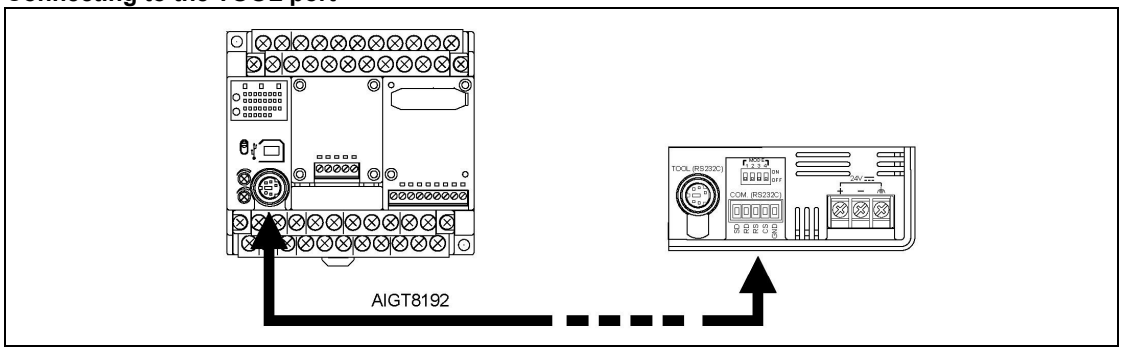
② **Time taken until the GT sends a next command after receiving a response:**

If a command is sent to quickly, the connected device may not be able to receive it.
The time can be specified in the delay time setting for transmission in the communication parameter of the GTWIN configuration setting.

4.3 Connection Method Between GT30 and PLCs

4.3.1 Connecting to the TOOL Port of FP-X

Connecting to the TOOL port

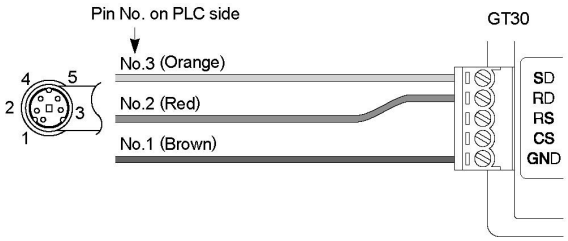


PLC	PLC communication cable	
FP-X	Mini-DIN 5-pin loose-wire cable	AIGT8192

Communication format settings

System register No.	Item	Value set
410	TOOL port unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	COM port1 Baud rate setting	9600 bps

Connecting to the TOOL port



PLC side

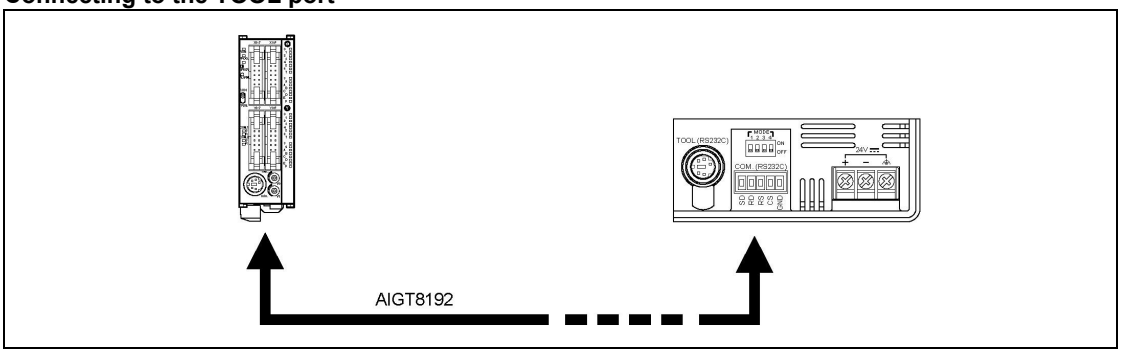
Pin No.	Signal name
1	SG
2	SD
3	RD
4	–
5	–

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.2 Connecting to the TOOL Port of FPΣ

Connecting to the TOOL port

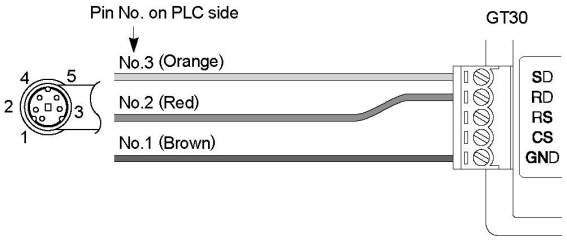


PLC	PLC communication cable	
FPΣ	Mini-DIN 5-pin loose-wire cable	AIGT8192

Communication format settings

System register No.	Item	Value set
410	TOOL port unit number	1
412	Modem connection	No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	TOOL port Baud rate setting	9600 bps

Connecting to the TOOL port



PLC side

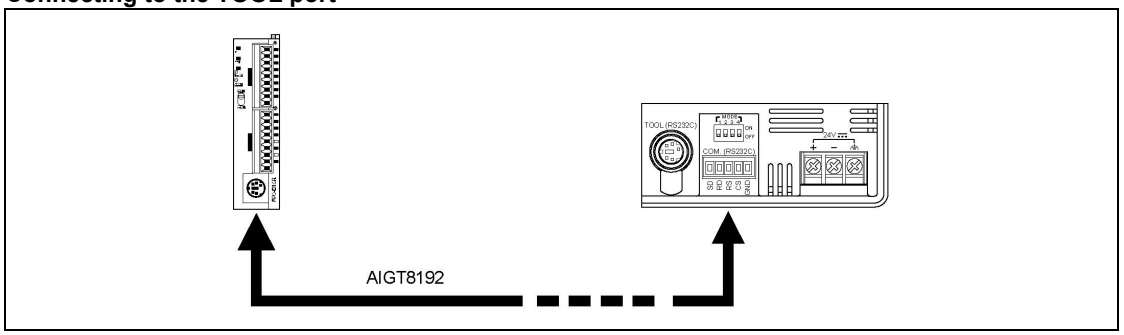
Pin No.	Signal name
1	SG
2	SD
3	RD
4	–
5	–

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.3 Connecting to the TOOL Port of FP0

Connecting to the TOOL port



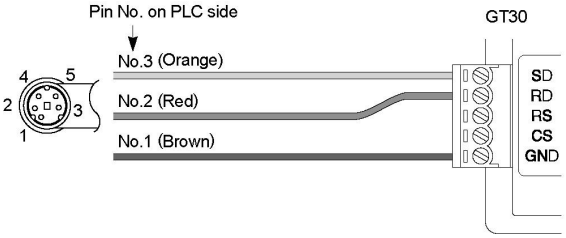
PLC	PLC communication cable	
FP0	Mini-DIN 5-pin loose-wire cable	AIGT8192

Communication format settings

System register No.	Item	Value set	System register value
410	Unit number	1	K1
411	Data length	8 bits	H0.
	Modem connection	No modem connection	
414	Baud rate setting	9600 bps	H010X Note) X is 0 to 6.

Note) To set 19200 bps for both the COM port and the TOOL port, “H0100” should be set.

Connecting to the TOOL port



PLC side

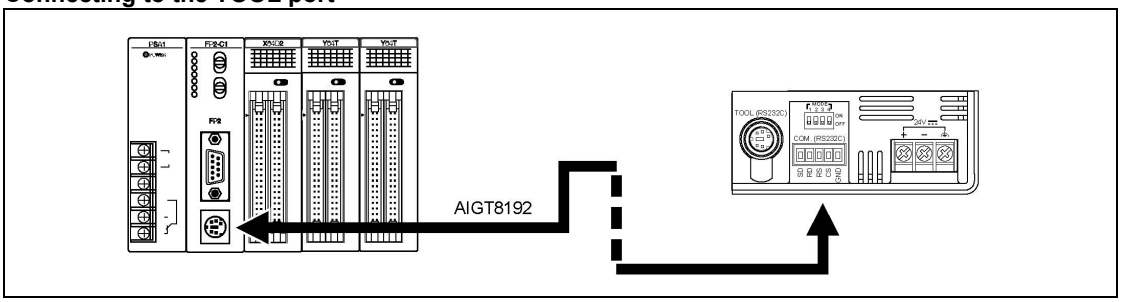
Pin No.	Signal name
1	SG
2	SD
3	RD
4	—
5	—

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.4 Connecting to the TOOL Port of FP2/FP2SH

Connecting to the TOOL port

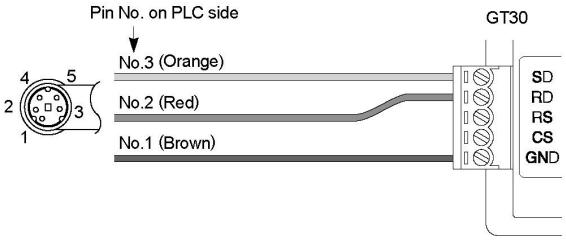


PLC	PLC communication cable	
FP2/FP2SH	Mini-DIN 5-pin loose-wire cable	AIGT8192

Communication format settings

System register No.	Item	Value set
410	Unit number	1
411	Data length	8 bits
	Modem connection	No modem connection
414	Baud rate setting	9600 bps

Connecting to the TOOL port



PLC side

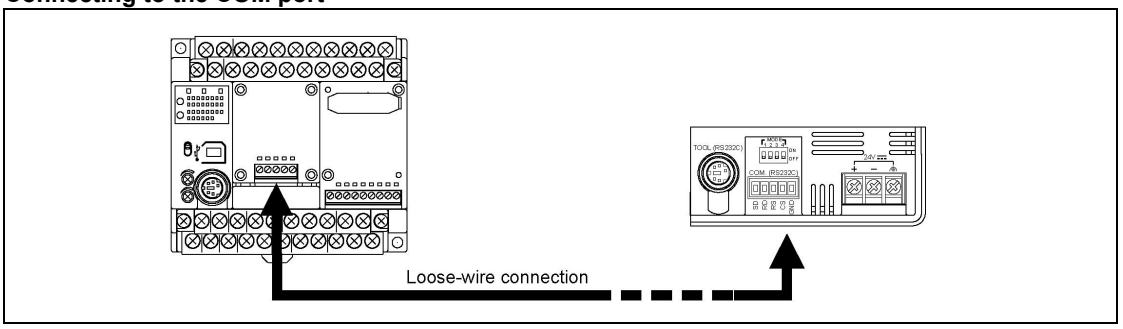
Pin No.	Signal name
1	SG
2	SD
3	RD
4	—
5	—

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.5 Connecting to the COM Port of FP-X

Connecting to the COM port



PLC	PLC communication cable
FP-X	Loose-wire cable

Communication format settings

When using the COM port 1

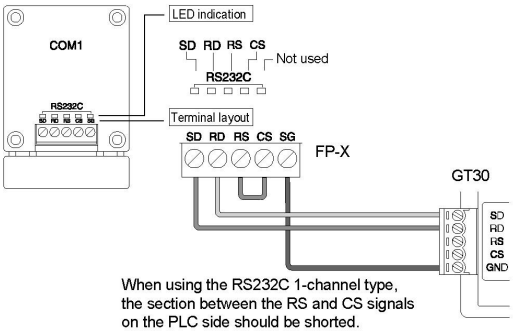
System register No.	Item	Value set
410	COM port 1 Unit number	1
412	COM port 1 Communication mode	Computer link No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	COM port 1 Baud rate setting	9600 bps

When using the COM port 2

System register No.	Item	Value set
4113	COM port 2 Unit number	1
412	COM port 2 Communication mode	Computer link No modem connection
414	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	COM port 2 Baud rate setting	9600 bps

Connecting to the 1-channel RS232C type

AFPX-COM1



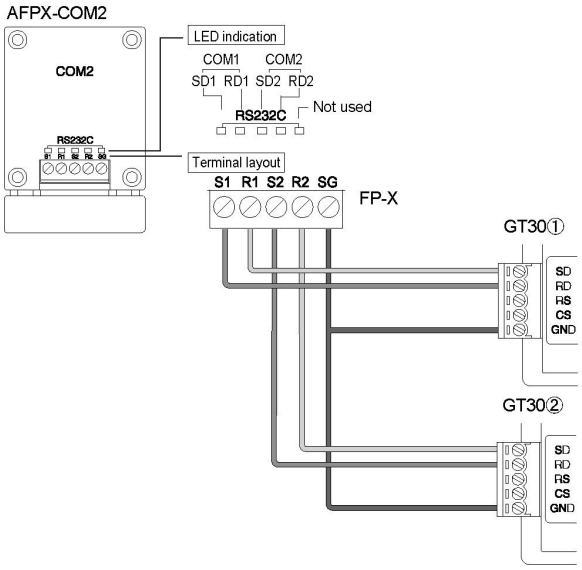
PLC side

Pin name	Signal name
SD	SD
RD	RD
RS	RS
CS	CS
SG	SG

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

Connecting to the 2-channel RS232C type



PLC side

Pin name	Signal name
S1	SD
R2	RD
S2	SD
R2	RD
SG	SG

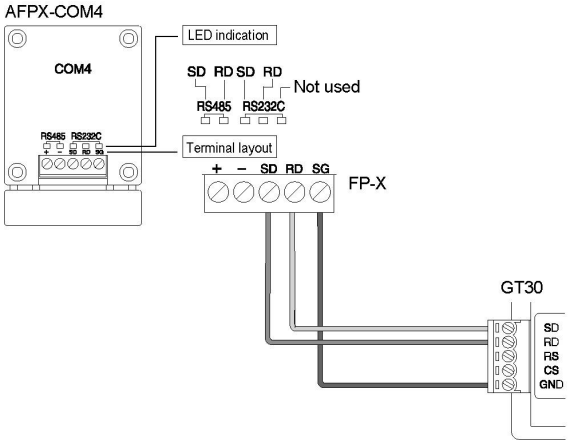
GT side 1 (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

GT side 2 (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

Connecting to the 1-channel RS485 and 1-channel RS232C type



PLC side

Pin name	Signal name
S+	+
S-	-
SD	SD
RD	RD
SG	SG

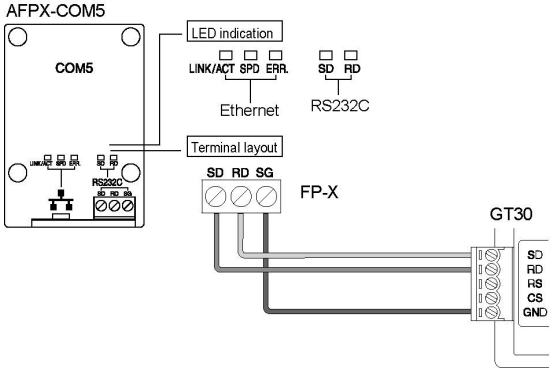
*Turn on the switch at the back of the cassette.

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	SG

Connecting to the 1-channel Ethernet and 1-channel RS232C type

Note) The connection with Ethernet is not available.



PLC side

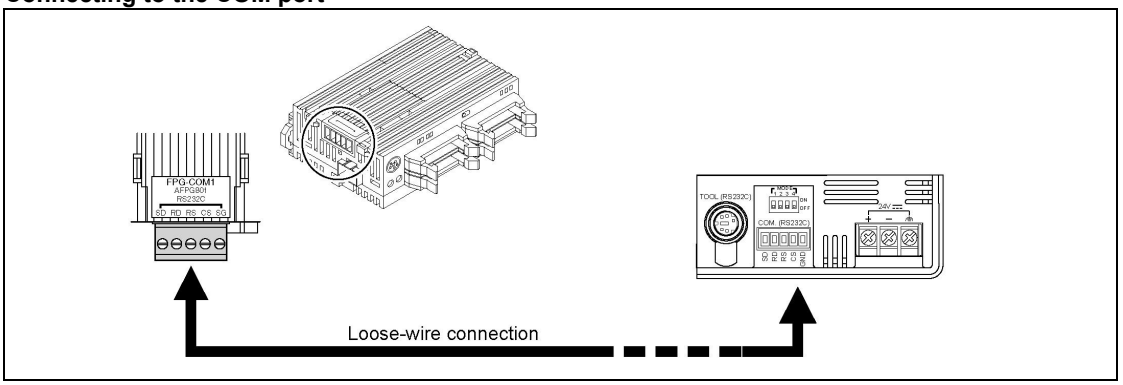
Pin name	Signal name
SD	SD
RD	RD
SG	SG

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.6 Connecting to the COM Port of FPΣ

Connecting to the COM port



PLC	PLC communication cable
FPΣ	Loose-wire cable

Communication format settings

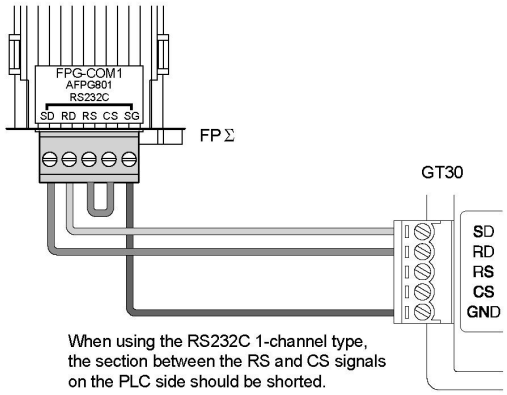
When using the COM port 1

System register No.	Item	Value set
410	COM port 1 Unit number	1
412	COM port 1 Communication mode	Computer link No modem connection
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	COM port 1 Baud rate setting	9600 bps

When using the COM port 2

System register No.	Item	Value set
4113	COM port 2 Unit number	1
412	COM port 2 Communication mode	Computer link No modem connection
414	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
415	COM port 2 Baud rate setting	9600 bps

Connecting to the COM port



When using the RS232C 1-channel type, the section between the RS and CS signals on the PLC side should be shorted.

When using the RS232C 1-channel type

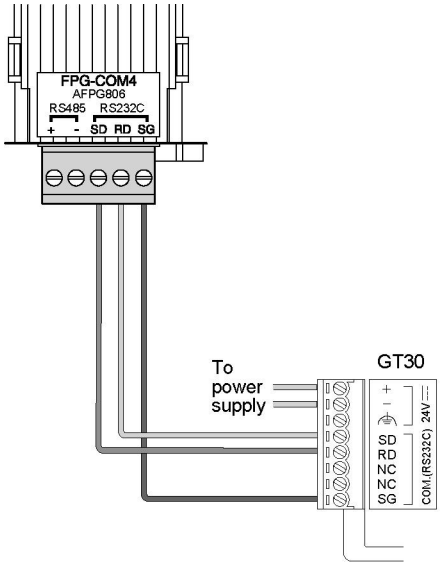
PLC side		GT side (RS232C)	
Pin name	Signal name	Pin No.	Signal name
SD	SD	1	SD
RD	RD	2	RD
RS	RS	3	RS
CS	CS	4	CS
GND	GND	5	GND

When using the RS232C 2-channel type

PLC side		GT side (RS232C)	
Pin name	Signal name	Pin No.	Signal name
S1	SD	1	SD
R1	RD	2	RD
S2	SD	3	RS
R2	RD	4	CS
GND	GND	5	GND

Connecting to the COM4 cassette

Note) The GT30 cannot be connected using the RS485.



PLC side

Pin name	Signal name
S+	+
S-	-
SD	SD
RD	RD
SG	SG

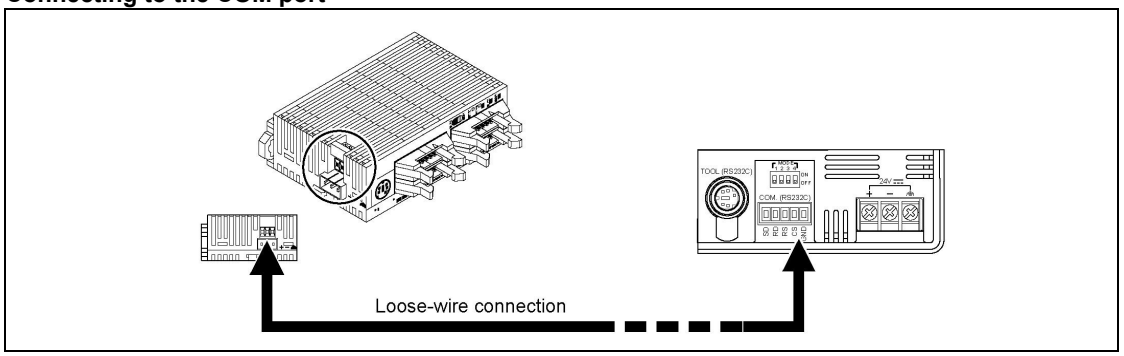
GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

* Turn on the switch of No. 1 at the back of the cassette.

4.3.7 Connecting to the COM Port of FP0

Connecting to the COM port



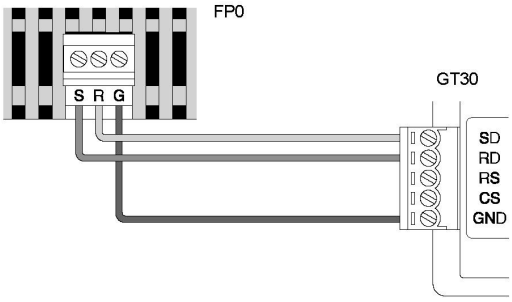
PLC	PLC communication cable
FP0	Loose-wire cable

Communication format settings

System register No.	Item	Value set	System register value
412	Selection of application of RS232C port	Computer link	K1
413	Data length	8 bits	K3
	Parity check	Yes, Odd	
	Stop bits	1 bit	
	End code	CR (Fixed)	
	Start code	No STX (Fixed)	
414	Baud rate setting	9600 bps	H0*00 Note)
415	Unit number	1	K1
416	Modem connection	No modem connection	H0

Note) To set 19200 bps for both the COM port and the TOOL port, “H0100” should be set.

Connecting to the COM port



PLC side

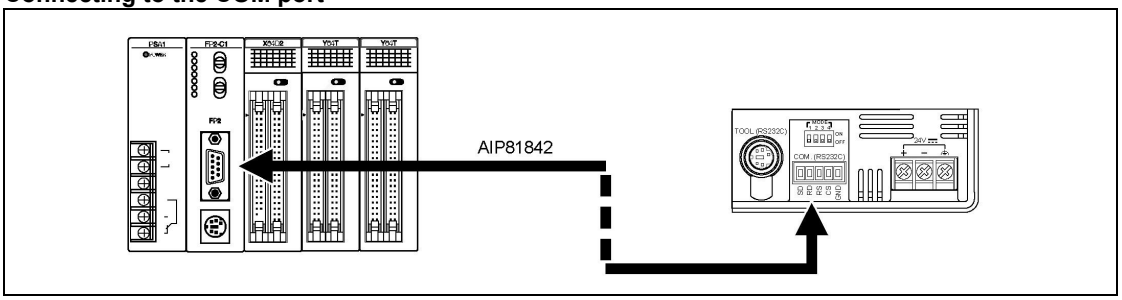
Pin name	Signal name
S	SD
R	RD
G	SG

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.3.8 Connecting to the COM Port of FP2/FP2SH

Connecting to the COM port

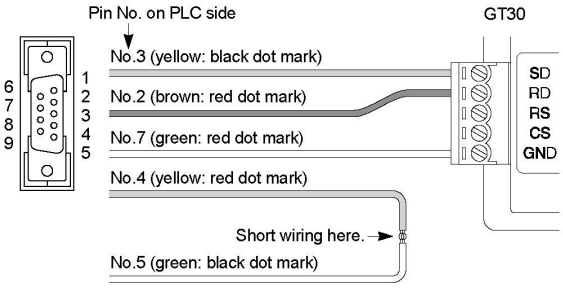


PLC	PLC communication cable	
FP2/FP2SH	D-SUB 9-pin loose-wire cable	AIP81842

Communication format settings

System register No.	Item	Value set
412	Selection of application of RS232C port	Computer link
413	Data length	8 bits
	Parity check	Yes, Odd
	Stop bits	1 bit
	End code	CR (Fixed)
	Start code	No STX (Fixed)
414	Baud rate setting	9600 bps
415	Unit number	1
416	Modem connection	No modem connection

Connecting to the COM port



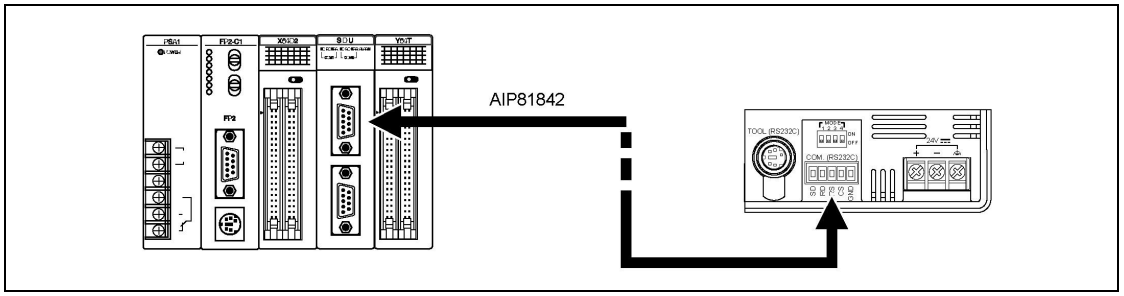
PLC side

Pin No.	Signal name
1	FG
2	SD
3	RD
4	RS
5	CS
6	N.C.
7	SG
8	N.C.
9	ER

GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

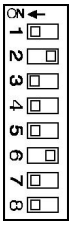
4.3.9 Connecting to FP2 Computer Communication Unit



PLC	PLC communication cable	
FP2	D-SUB 9-pin loose-wire cable	AIP81842

DIP switch settings on the backside of FP2 computer communication unit

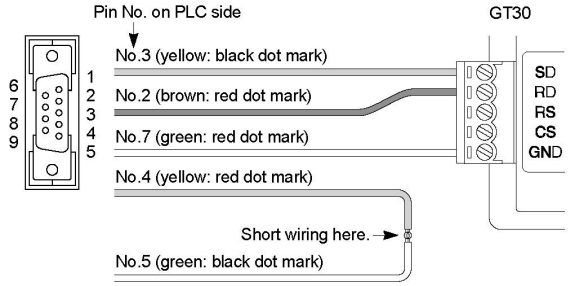
SW No.	Setting contents	Value set	Switch status
1	Reserved for system		ON
2	COM1 baud rate	9600 bps	OFF
3			ON
4	COM1 data length	8 bits	ON
5	Reserved for system		ON
6	COM2 baud rate	9600 bps	OFF
7			ON
8	COM2 data length	8 bits	ON



* If both serial ports of the FP2 computer communication unit are being used, each port should be set individually as shown at theleft.

With the FP2 CCU, the parity check is fixed at “Odd”, and the number of stop bits is fixed at “1 bit”.

Connecting to the FP2 computer communication unit (CCU)



PLC side

Pin No.	Signal name
1	FG
2	SD
3	RD
4	RS
5	CS
6	N.C.
7	SG
8	N.C.
9	ER

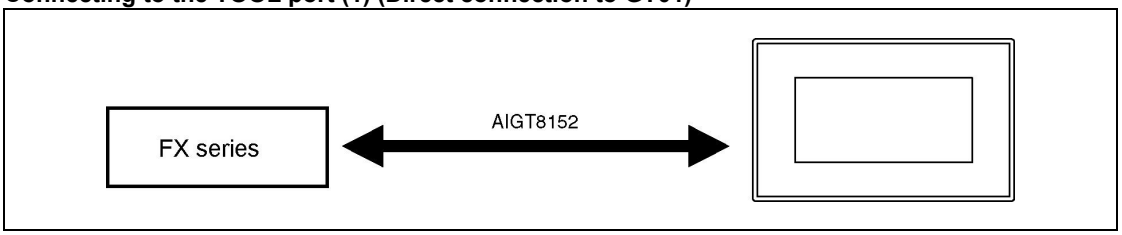
GT side (RS232C)

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

4.4 Connection Between GT01/GT05/GT11/GT21/GT32 and PLCs by Mitsubishi Electric Corporation

4.4.1 Connecting to FX series

Connecting to the TOOL port (1) (Direct connection to GT01)



PLC	PLC communication cable		Programmable display			
FX series	Mini-DIN 8-pin loose-wire cable	AIGT8152	GT01	RS422	5 V DC	AIGT0*32B1 AIGT0*32H1

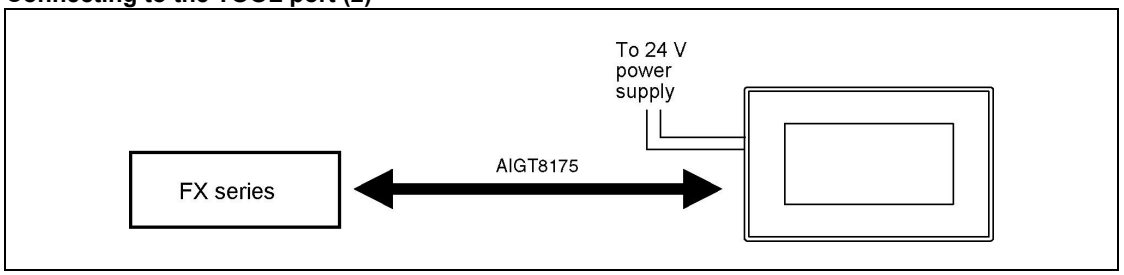
Tool port connection of GT01 and FX Series

●PLC			●GT01	
Pin No.	Signal Name		Pin No.	Signal Name
1	-RD		+	+5V
2	+RD		-	GND
3	SG		NC	NC
4	-SD		+SD	+SD
5	+5V		-SD	-SD
6	—		+RD	+RD
7	+SD		-RD	-RD
8	—	Short	E	Terminal station setting (120W resistor built in)

Note:

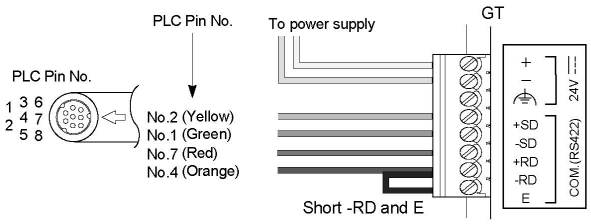
- Keep the cable no longer than 2 m
- GT01 power consumption corresponds to that of Mitsubishi's F920 (5 V type) display device. When using, adhere to the conditions of use (number of units that can be expanded on a PLC, etc.) for the F920 (5 V type).

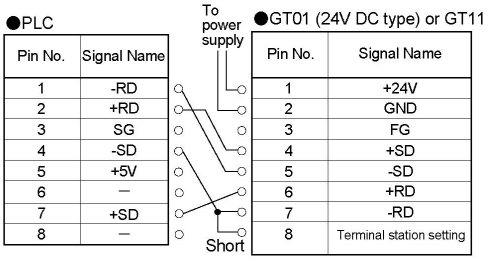
Connecting to the TOOL port (2)



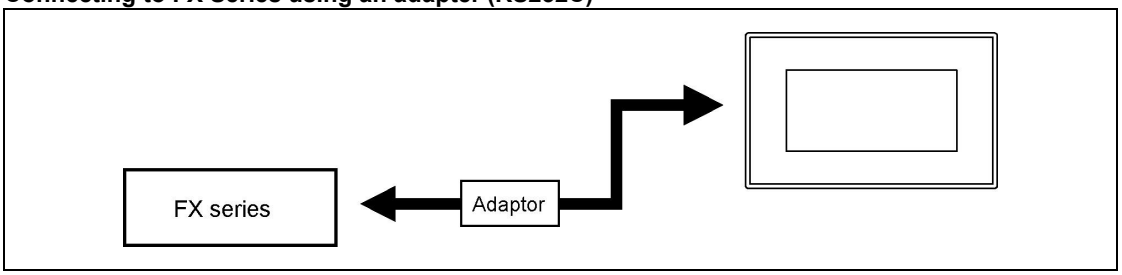
PLC	PLC communication cable		Programmable display			
FX series	Mini-DIN 8-pin loose-wire cable	AIGT8175	GT01	RS422	24 V DC type	AIGT0*32B AIGT0*32H
			GT11			AIGT2032* AIGT2132*
			GT21			AIGT2232B AIGT2232H
			GT32			AIG32*Q*4D AIG32*Q*5D
			GT05			AIG05*Q04D AiG05*Q05D

Tool port connection of GT01 and FX Series





Connecting to FX Series using an adaptor (RS232C)



PLC	PLC communication cable	Programmable display			
FX series	Loose-wire cable	GT01	RS232C	24 V DC type	AIGT0*30B AIGT0*30H
		GT11			AIGT2030* AIGT2130*
		GT21			AIGT2230B AIGT2230H
		GT32			AIG32*Q*2D AIG32*Q*3D
		GT05			AIG05*Q02D AiG05*Q03D

Connection method

CPU	Adaptor	Wiring diagram
FX1N	FX1N-232-BD	Mitsubishi Electric PLC adapter side / To power supply / GT side
FX2N	FX2N-232-BD	
FX3U FX3UC	FX3U-232-BD FX3U-232-ADP	

Pin No.	Signal name
1	CD
2	RD
3	SD
4	ER
5	SG
6	DR
7	
8	
9	

Pin No.	Signal name
1	+
2	–
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

Be aware that communication will not be possible if the above adaptor cannot be connected to the FX series.
Although No. 6 and 7 of the GT11, GT21, GT32 and GT05 is RS/CS, they can be used in the above connection.

Setting the communication conditions for the PLC

"0" should be stored in D8120. ("0" is the default value, so this setting should not need to be entered by the user.)

Note:

The RS422 type GT01 and FX series does not support the communication using the adapter for RS422 (or RS485).

Selecting the PLC model on GTWIN

FX-series PLC made by Mitsubishi	PLC model name to be selected
FX1N	Mitsubishi MELSEC-FX series
FX2N/FX3U/FX3UC	Mitsubishi MELSEC-FX2N series

Note) The selection varies according to the PLC to be used.

Setting the communication conditions

Setting communication conditions on the GT side

Set the COM. port communication conditions as follows.

Item	Value set
Baud rate	9600 bps
Data length	7 bits
Parity check	Yes, even
Stop bit	1 bit

Usable devices

Device type		FX1N range No.	FX2N/FX3U/FX3UC range No.	Remarks
Bit device	Input relay (X)	X0000 to X0337	X0000 to X0337	
	Output relay (Y)	Y0000 to Y0337	Y0000 to Y0337	
	Internal relay (M)	M0000 to M1535	M0000 to M3071	
	State (S)	S0000 to S0999	S0000 to S0999	
	Timer (contact) (TS)	TS0000 to TS0255	TS0000 to TS0255	
	Counter (contact) (CS)	CS0000 to CS0255	CS0000 to CS0255	
Word device	Input relay (X)	X0000 to Y0320	X0000 to X0320	Designate the address in increments of 20.
	Output relay (Y)	Y0000 to Y0320	Y0000 to Y0320	Designate the address in increments of 20.
	Internal relay (M)	M0000 to M1520	M0000 to M3056	Designate the address in increments of 16
	State (S)	S0000 to S0976	S0000 to S0976	Designate the address in increments of 16.
	Timer (current value) (TN)	TN0000 to TN0255	TN0000 to TN0255	
	Counter (current value) (CN)	CN0000 to CN0255	CN0000 to CN0255	
	Data register (D)	D0000 to D0999	D0000 to D0999	

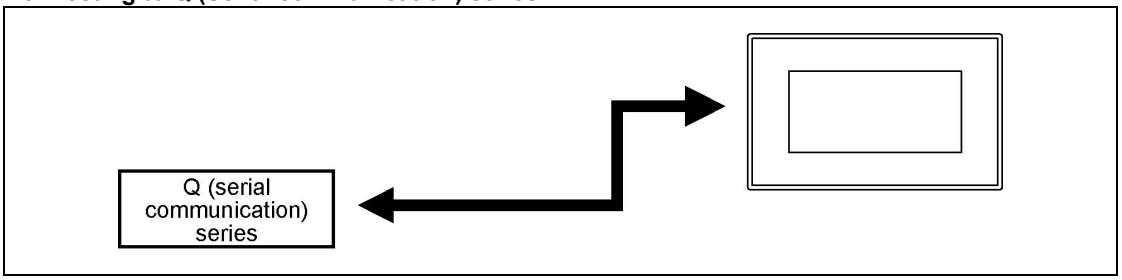
Note1) The addresses you can use may differ depending on the model. For details, please see the manual for the PLC you are using.

Note2) If using an input relay, output relay and auxiliary relay in word units, please set the address in 16 point increments from 000. (X000, X020, X040 …, M000, M016, M032).

Reference: <Chapter 8 Troubleshooting>

4.4.2 Connecting to Q series

Connecting to Q (Serial communication) series



PLC	PLC communication cable	Programmable display			
Q (Serial communication) series	Loose-wire cable	GT01	RS232C	24 V DC type	AIGT0*30B AIGT0*30H
		GT11			AIGT2030* AIGT2130*
		GT21			AIGT2230B AIGT2230H
		GT32			AIG32*Q*2D AIG32*Q*3D
		GT05			AIG05*Q02D AiG05*Q03D

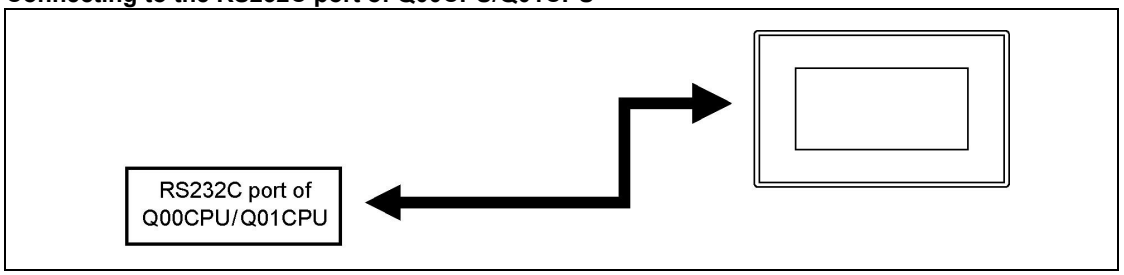
CPU	Serial communication module	Wiring diagram
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q00HCPU Q01CPU Q00JCPU	QJ71C24-R2 QJ71C24N-R2	Mitsubishi Electric Serial communication side / To power supply / GT side

Pin No.	Signal name
1	CD
2	RD
3	SD
4	DTR(ER)
5	SG
6	SDR(DR)
7	RS
8	CS
9	RI

Pin No.	Signal name
1	+
2	-
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

Although No. 6 and 7 of the GT11, GT21, GT32 and GT05 is RS/CS, they can be used in the above connection.

Connecting to the RS232C port of Q00CPU/Q01CPU



PLC	PLC communication cable	Programmable display			
Q00CPU Q01CPU	Loose-wire cable	GT01	RS232C	24 V DC type	AIGT0*30B AIGT0*30H
		GT11			AIGT2030* AIGT2130*
		GT21			AIGT2230B AIGT2230H
		GT32			AIG32*Q*2D AIG32*Q*3D
		GT05			AIG05*Q02D AiG05*Q03D

CPU	Link I/F	Wiring diagram
Q00CPU Q01CPU	RS232C port on CPU unit	Mitsubishi Electric PLC side Mini-Din 6-pin To power supply GT side

Pin No.	Signal name
1	RD
2	SD
3	SG
4	-
5	DR
6	ER

Pin No.	Signal name
1	+
2	-
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

Although No. 6 and 7 of the GT11, GT21, GT32 and GT05 is RS/CS, they can be used in the above connection.

Selecting the PLC model on GTWIN

PLC made by Mitsubishi	PLC model name to be selected
Q (Serial communication)series	Mitsubishi MELSEC-Q (Serial communication) series

Setting the communication conditions

Setting communication conditions on the GT side

Set the COM. port communication conditions as follows.

Item	Value set
PLC unit	0
Baud rate	19200 bps
Data length	8 bits
Parity check	Odd
Stop bit	1 bit
Checksum	Avaiable

Setting communication conditions on the PLC side

Set the communication conditions as follows. Some items cannot be set depending on the used model. There is no need to set the items that are not available.

Item	Value set
Unit No.	0
Baud rate	19200 bps
Data length	8 bits
Parity check	Odd
Stop bit	1 bit
Checksum	Available
Interface	RS232C
Dedicated protocol control procedure	Format 4

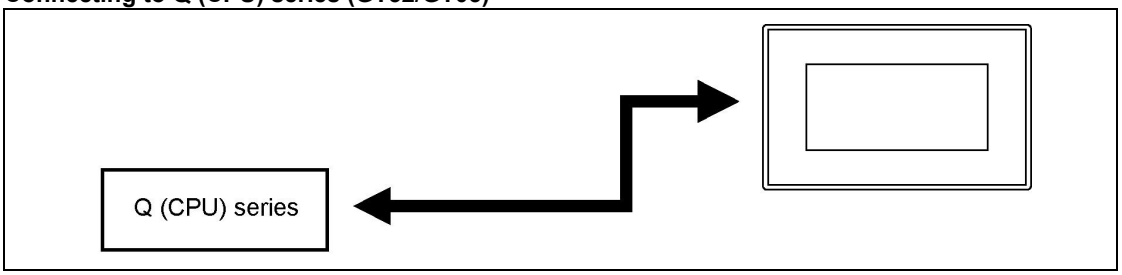
Usable devices

Device type		Number	Remarks
Bit device	Input Relay	X000000-X001FFF	
	Output Relay	Y000000-Y001FFF	
	Internal Relay	M000000-M032767	
	Latch relay	L000000-L032767	
	Annunciator	F000000-F032767	
	Edge relay	V000000-V032767	
	Link Relay	B000000-B007FFF	
	Special relay	SM000000-SM002047	
	Link special relay	SB000000-SB0007FF	
	Step relay	S000000-S008191	
	Direct access input	DX000000-DX001FFF	
	Direct access output	DY000000-DY001FFF	
	Timer(contact)	TS000000-TS023087	
	Timer(coil)	TC000000-TC023087	
	Retentive timer(contact)	SS000000-SS023087	
	Retentive timer(coil)	SC000000-SC023087	
	Counter(contact)	CS000000-CS023087	
	Counter(coil)	CC000000-CC023087	
Word device	Input Relay	X000000-X001FF	Specify address expression every 10
	Output Relay	Y000000-Y001FF0	Specify address expression every 10
	Internal Relay	M000000-M032752	Specify address expression every 16 multiples
	Latch relay	L000000-L032752	
	Annunciator	F000000-F032752	
	Edge relay	V000000-V032752	
	Link Relay	B000000-B007FF0	Specify address expression every 10
	Special relay	SM000000-SM002032	
	Link special relay	SB000000-SB0007F0	
	Step relay	S000000-S008176	
	Direct access input	DX000000-DX001FFF	
	Direct access output	DY000000-DY001FFF	
	Timer(current)	TN000000-TN023087	
	Retentive timer(Current value)	SN000000-SN023087	
	Counter(current)	CN000000-CN023087	
	Data Register	D000000-D025983	
	Link Register	W000000-W00657F	
	Link special register	SW000000-SW0007FF	
	File Register(for block number)	R000000-R032767	
	File register(for sequential number)	ZR000000-ZR1042431	
	Special register	SD000000-SD002047	

Note:

- The maximum value that can be set with the GT is described.
- The range of usable addresses differs depending on the model. For details, please consult the manual for the PLC you will use.
- When you use a serial communication module, you will set some parameters(Slot No. ,Module type, I/O points and Start address etc). Input and output relay from the start address for set points can't be used.

Connecting to Q (CPU) series (GT32/GT05)



PLC	PLC communication cable	Programmable display			
Q(CPU) series	Loose-wire cable	GT32	RS232C	24 V DC type	AIG32*Q*2D AIG32*Q*3D
		GT05			AIG05*Q02D AiG05*Q03D

CPU	Link I/F	Wiring diagram
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU	RS232C port on CPU unit	Mitsubishi Electric PLC side Mini-Din 6-pin To power supply GT side

Pin No.	Signal name
1	RD
2	SD
3	SG
4	-
5	DR
6	ER

Pin No.	Signal name
1	+
2	-
3	FG
4	SD
5	RD
6	RS
7	CS
8	SG

Selecting the PLC model on GTWIN

PLC made by Mitsubishi	PLC model name to be selected
Q (CPU)series	Mitsubishi MELSEC-Q (CPU) series

Setting the communication conditions

Setting communication conditions on the GT side

Set the COM. port communication conditions as follows.

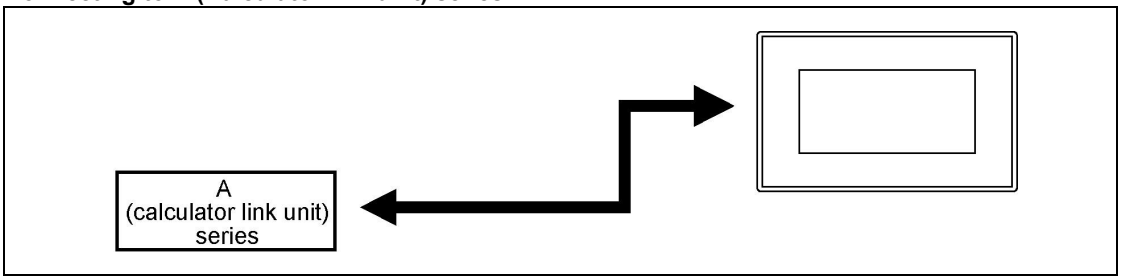
Item	Value set
PLC unit	0
Baud rate	19200 bps
Data length	7 bits
Parity check	Even
Stop bit	1 bit

Usable devices

Device type		Number	Remarks
Bit device	Input Relay	X000000-X001FFF	
	Output Relay	Y000000-Y001FFF	
	Internal Relay	M000000-M032767	
	Latch relay	L000000-L032767	
	Annunciator	F000000-F032767	
	Edge relay	V000000-V032767	
	Link Relay	B000000-B007FFF	
	Special relay	SM000000-SM002047	
	Link special relay	SB000000-SB0007FF	
	Step relay	S000000-S008191	
	Timer(contact)	TS000000-TS023087	
	Timer(coil)	TC000000-TC023087	
	Retentive timer(contact)	SS000000-SS023087	
	Retentive timer(coil)	SC000000-SC023087	
	Counter(contact)	CS000000-CS023087	
	Counter(coil)	CC000000-CC023087	
Word device	Input Relay	X000000-X001FF	Specify address expression every 10
	Output Relay	Y000000-Y001FF0	Specify address expression every 10
	Internal Relay	M000000-M032752	Specify address expression every 16 multiples
	Latch relay	L000000-L032752	
	Annunciator	F000000-F032752	
	Edge relay	V000000-V032752	
	Link Relay	B000000-B007FF0	Specify address expression every 10
	Special relay	SM000000-SM002032	
	Link special relay	SB000000-SB0007F0	
	Step relay	S000000-S008176	
	Timer(current)	TN000000-TN023087	
	Retentive timer(Current value)	SN000000-SN023087	
	Counter(current)	CN000000-CN023087	
	Data Register	D000000-D025983	
	Link Register	W000000-W00657F	
	Link special register	SW000000-SW0007FF	
	File Register(for block number)	R000000-R032767	
	File register(for sequential number)	ZR000000-ZR1042431	
	Special register	SD000000-SD002047	

4.4.3 Connecting to A series

Connecting to A (Calculator link unit) series



PLC	PLC communication cable	Programmable display			
A (Calculator link unit) series	Loose-wire cable	GT01	RS232C	24 V DC type	AIGT0*30B AIGT0*30H
		GT11			AIGT2030* AIGT2130*
		GT21			AIGT2230B AIGT2230H
		GT32			AIG32*Q*2D AIG32*Q*3D
		GT05			AIG05*Q02D AiG05*Q03D

Connection method

CPU	Serial communication module	Wiring diagram
A1N A2N A3N	AJ71C24 AF71C24-S3 AJJ71C24-S6 AF71C24-S8 AJ71UC24 (A2N only)	Mitsubishi Electric Serial communication module side / To power supply / GT main unit side Pin No. – Signal name: 1 FG, 2 SD, 3 RD, 4 RS, 5 CS, 6 DR, 7 SG, 8 CD, 20 ER Pin No. – Signal name: 1 +, 2 -, 3 FG, 4 SD, 5 RD, 6 NC, 7 NC, 8 SG
A1S	A1SJ71C24-R2 A1SJ71UC24-R2	Mitsubishi Electric Serial communication module side / To power supply / GT main unit side Pin No. – Signal name: 1 CD, 2 RD, 3 SD, 4 ER, 5 SG, 6 DR, 7 RS, 8 CS, 9 Pin No. – Signal name: 1 +, 2 -, 3 FG, 4 SD, 5 RD, 6 NC, 7 NC, 8 SG
A1SJ A2SH A1SH	A1SJ71UC24-R2	
A2CCPU24	RS232C port on CPU unit	

Although No. 6 and 7 of the GT11, GT21, GT32 and GT05 is RS/CS, they can be used in the above connection.

Selecting the PLC model on GTWIN

PLC made by Mitsubishi	PLC model name to be selected
A (Calculator link unit) series	Mitsubishi MELSEC-A (Calculator link unit) series

Setting the communication conditions

Setting communication conditions on the GT side

Set the COM. port communication conditions as follows.

Item	Value set
PLC unit	0
Baud rate	19200 bps
Data length	7 bits
Parity check	Even
Stop bit	1 bit

Setting communication conditions on the PLC side

Set the communication conditions as follows. Some items cannot be set depending on the used model. There is no need to set the items that are not available.

Item	Value set
Unit No.	0
Baud rate	19200 bps
Data length	7 bits
Parity check	Even
Stop bit	1 bit
Checksum	Available
Interface	RS232C
Dedicated protocol control procedure	Format 4

Usable devices Device type		FX1N range No.	Remarks
Bit device	Input relay	X0000 to X07FF	
	Output relay	Y0000 to Y07FF	
	Internal relay	M0000 to M2047	
	State	B0000 to B03FF	
	Timer (contact)	TS0000 to TS0255	
	Counter (contact)	CS0000 to CS0255	
Word device	Input relay	X0000 to X07F0	Designate the address of first digit with 0.
	Output relay	Y0000 to Y07F0	Designate the address of first digit with 0.
	Internal relay	M0000 to M2032	Designate the address in increments of 16
	Link relay	B0000 to B03F0	Designate the address of first digit with 0.
	Timer (current value)	TN0000 to TN0255	
	Counter (current value)	CN0000 to CN0255	
	Data register	D0000 to D1023	
	Link register	W0000 to W03FF	
	File register	R0000 to R8191	

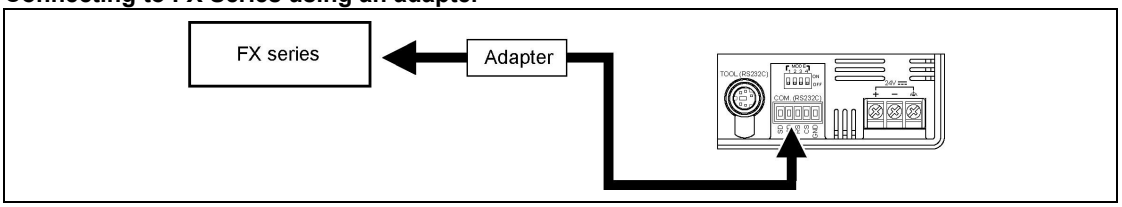
Note:

- The maximum value that can be set with the GT is described.
- The range of usable addresses differs depending on the model.
  For details, please consult the manual for the PLC you will use.

4.5 Connection Between GT30 and PLCs by Mitsubishi Electric Corporation

4.5.1 Connecting to FX series

Connecting to FX Series using an adapter



PLC	PLC communication cable
FX series	Loose-wire cable

Connection method

CPU	Calculator link unit	Wiring diagram
FX1N	FX1N-232-BD	Mitsubishi Electric PLC adapter side / GT main unit side
FX2N	FX2N-232-BD	
FX3U FX3UC	FX3U-232-BD FX3U-232-ADP	

Pin No.	Signal name
1	CD
2	RD
3	SD
4	ER
5	SG
6	DR
7	
8	
9	

Pin No.	Signal name
1	SD
2	RD
3	RS
4	CS
5	GND

Note) Be aware that communication will not be possible if the above adaptor cannot be connected to the FX series.

Setting the communication conditions

Setting communication conditions on the GT side

Set the COM. port communication conditions as follows.

Item	Value set
Baud rate	9600 bps
Data length	7 bits
Parity check	Yes, Even
Stop bit	1 bit

Setting communication conditions on the PLC side

"0" should be stored in D8120. ("0" is the default value, so this setting should not need to be entered by the user.)

Usable devices

Device type	Address range	Points
Input relay	X000 to X377 (Octal notation)	256 points
Output relay	Y000 to Y377 (Octal notation)	256 points
Auxiliary relay	M0000 to M1535 (Decimal notation)	1536 points
Data register	D0000 to D1023 (Decimal notation)	1024 words

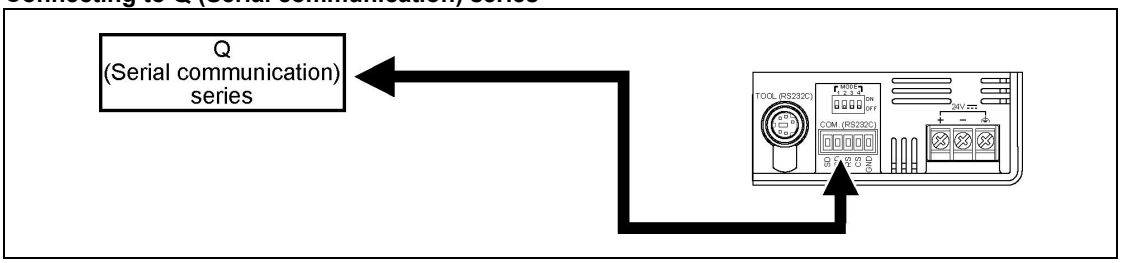
Note1) Depending on the type being used, the address range may be limited to a small range. Refer to the instruction manual of the PLC being used for detailed information.

Note2) If input relays, output relays and auxiliary relays are being used in word units, addresses should be specified in 16-point units, starting from 000. (X000, X020, X040, …)

Reference: <Chapter 6 Troubleshooting>

4.5.2 Connecting to Q series

Connecting to Q (Serial communication) series



PLC	PLC communication cable
Q (Serial communication) series	Loose-wire cable

Connection method

CPU	Serial communication module	Wiring diagram
Q02CPU Q02HCPU Q06HCPU Q12HCPU Q25HCPU Q00CPU Q00HCPU Q01CPU Q00JCPU	QJ71C24-R2 QJ71C24N-R2	Mitsubishi Electric Serial communication side Pin No. / Signal name: 1 CD, 2 RD, 3 SD, 4 DTR(ER), 5 SG, 6 SDR(DR), 7 RS, 8 CS, 9 RI GTside Pin No. / Signal name: 1 SD, 2 RD, 3 RS, 4 CS, 5 GND

Selecting the PLC model on GTWIN

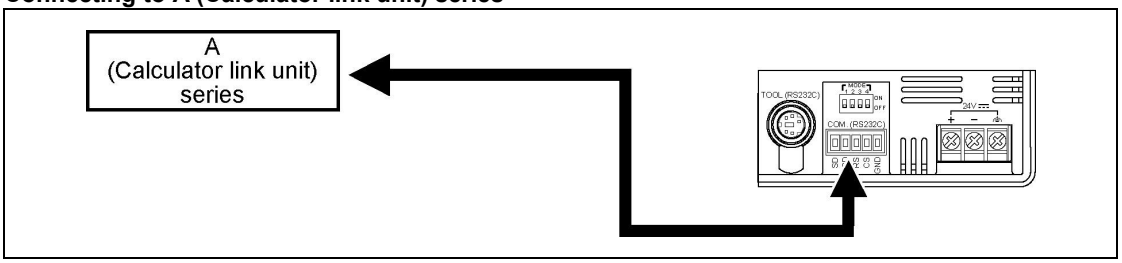
PLC made by Mitsubishi	PLC model name to be selected
Q (Serial communication) series	Mitsubishi MELSEC-Q (Serial communication) series

For the details of communication condition settings and usable devices, refer to the following.

Reference: <4.4.2 Connecting to Q series>

4.5.3 Connecting to A series

Connecting to A (Calculator link unit) series



PLC	PLC communication cable
A (Calculator link unit) series	Loose-wire cable

Connection method

CPU	Serial communication module	Wiring diagram
A1N A2N A3N	AJ71C24 AF71C24-S3 AJJ71C24-S6 AF71C24-S8 AJ71UC24 (A2N only)	Mitsubishi Electric Serial communication module side Pin No. / Signal name: 1 FG, 2 SD, 3 RD, 4 RS, 5 CS, 6 DR, 7 SG, 8 CD, 20 ER GT main unit side Pin No. / Signal name: 1 SD, 2 RD, 3 RS, 4 CS, 5 GND
A1S	A1SJ71C24-R2 A1SJ71UC24-R2	Mitsubishi Electric Serial communication module side Pin No. / Signal name: 1 CD, 2 RD, 3 SD, 4 ER, 5 SG, 6 DR, 7 RS, 8 CS, 9 GT main unit side Pin No. / Signal name: 1 SD, 2 RD, 3 RS, 4 CS, 5 GND
A1SJ A2SH A1SH	A1SJ71UC24-R2	
A2CCPU24	RS232C port on the CPU unit	

Selecting the PLC model on GTWIN

PLC made by Mitsubishi	PLC model name to be selected
A (Calculator link unit) series	Mitsubishi MELSEC-A (Calculator link unit) series

For the details of communication condition settings and usable devices, refer to the following.

Reference: <4.4.3 Connecting to A series>

4.6 Other Connections

4.6.1 Connecting to the PLCs made by Other Companies

See GTWIN HELP for information on the connection with PLCs manufactured by other companies.

4.6.2 Connecting to a Serial Device

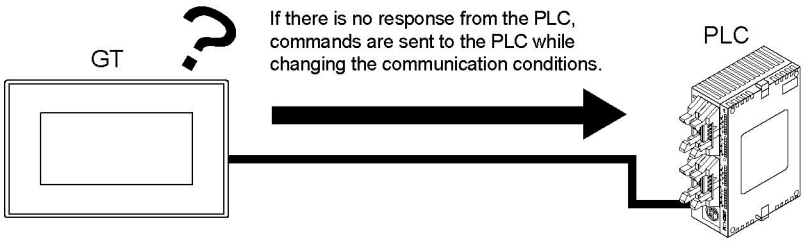
Devices other than PLCs can be connected by using the general-purpose serial communication mode of the GT. Also, PLCs made by other companies which are not put on our website can be used. See our website or the GT series General-purpose serial communication manual.

Reference: <GT Series General-purpose Serial Communication Manual ARCT1F356E>

4.7 Connection With a PLC

4.7.1 Automatic Communication Settings Function

After turning on the power supply, if there is not response from the PLC connected to the GT, the GT switches to the automatic setting mode for the communication conditions. In the automatic setting mode, commands are sent to the PLC while changing the communication conditions in the sequence shown below.



① 9600 bps, 8 bits, odd parity, 1 stop bit
② 19200 bps, 8 bits, odd parity, 1 stop bit
③ 115200 bps, 8 bits, odd parity, 1 stop bit
④ Communication conditions set in GTWIN Configuration settings

The GT, in automatic setting mode, continues to repeat steps ① to ④ until there is a response from the PLC. While it is repeating there steps, it is in the “Standby” mode under “Configuration” → “Communication Parameters” → “Handle Communication Error” on GTWIN.

Reference: For the information on the setting method, <Chapter 5 GT Configuration Settings>

Explanation of this function:

- Conditions when the automatic settings mode is in effect
  If communication is attempted the specified number of times nad there is no response from the PLC, the GT goes into the automatic settings mode. The number of attempts is specified using the “No. of Retries” parameter under “GT Configuration” → “Communication Parameters” → “Handle Communication Error” on GTWIN.
- Automatically set communication conditions
  In the automatic settings mode, if there is a response from the PLC, subsequent communication is carried out under conditions matching the response. The main unit configuration settings are not updated, however, even if the communication parameters are different from those of the main unit configuration settings.

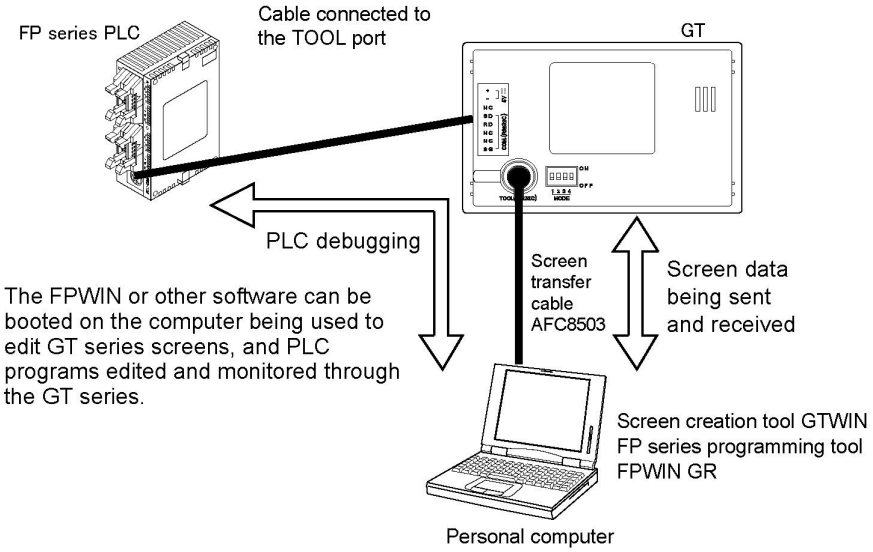
Note:

- An error response from the PLC is taken as a response, and the GT does not go into the automatic settings mode.
- If the unit is connected to the COM port of the FP0/FP1/FP2/FP2SH/FP-M, communication between the FP device and the PLC will not be possible if the target usage of the RS232C port has not been set to “Computer Link”. Always set the setting on the PLC side to match “Computer Link”.
- The automatic communication settings function cannot be used for the communcation at 230400 bps on the GT01, GT11 or GT21.

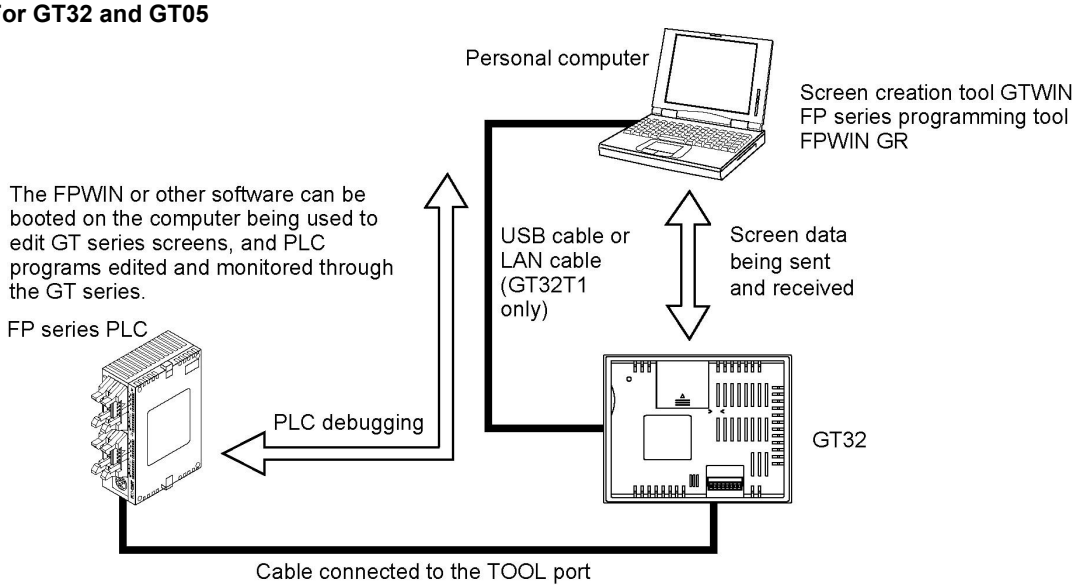
4.7.2 Through Function

With the GT series, communication can be set to take place automatically between the COM port of a GT and TOOL port of a PLC in a “through function”. When the FP series tool software installed in the computer connected to the GT series as shown below is booted, PLC programs can be edited through the GT series. The through function does not require any special settings, and is always in the standby mode.

For GT01, GT11, GT21 and GT30


FP series PLC
Cable connected to the TOOL port
GT
PLC debugging
Screen transfer cable AFC8503
Screen data being sent and received
The FPWIN or other software can be booted on the computer being used to edit GT series screens, and PLC programs edited and monitored through the GT series.
Screen creation tool GTWIN
FP series programming tool
FPWIN GR
Personal computer

For GT32 and GT05

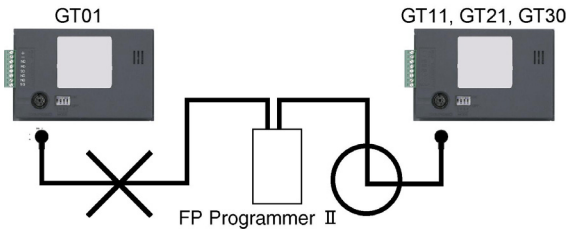

Personal computer
Screen creation tool GTWIN
FP series programming tool
FPWIN GR
The FPWIN or other software can be booted on the computer being used to edit GT series screens, and PLC programs edited and monitored through the GT series.
USB cable or LAN cable (GT32T1 only)
Screen data being sent and received
FP series PLC
PLC debugging
GT32
Cable connected to the TOOL port

Note:

- **Precautions when using the through function**
  The system should be set up so that the Timeout period in the FP series software (FPWIN) (A) is larger than the waiting time for communication retries of the GT COM port (B), meaningn (A) > (B). If the system is set up so that A = B or A < B, the through function will not work properly.
  When the baud rate of the GT TOOL port is 230400 bps, the through function cannot be used. Communicate at 115200 bps or lower for using the throught function.

- **Restrictions on COM port connections**
  When connecting the GT01 to the COM port of a PLC, a separate external supply must be provided.

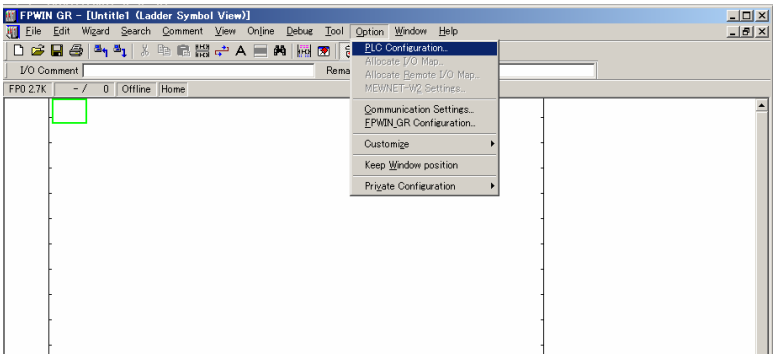
- **When using the FP programmer II**
  An FP Programmer II cannot be connected to the tool port of the GT01. It can be connected to the GT11, GT21 and GT30. The GT32 cannot be connected to the FP programmer II as it is connected with USB or Ethernet.



4.7.3 How to Make Communication Settings Using the FPWIN GR

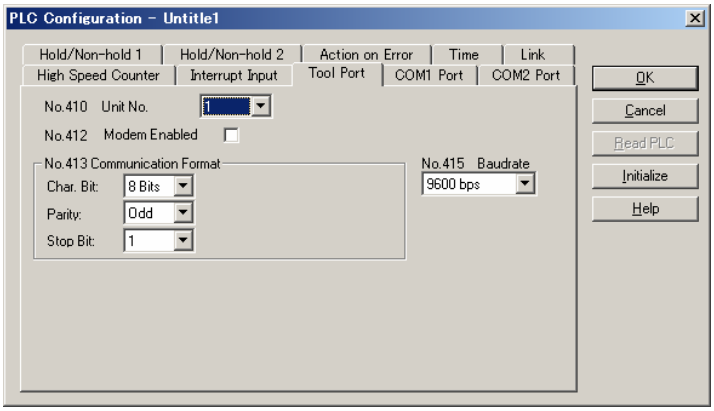
Please read below to make PLC communication settings using the FPWIN GR.

1. Select “PLC system register setting” from the Option menu (O).

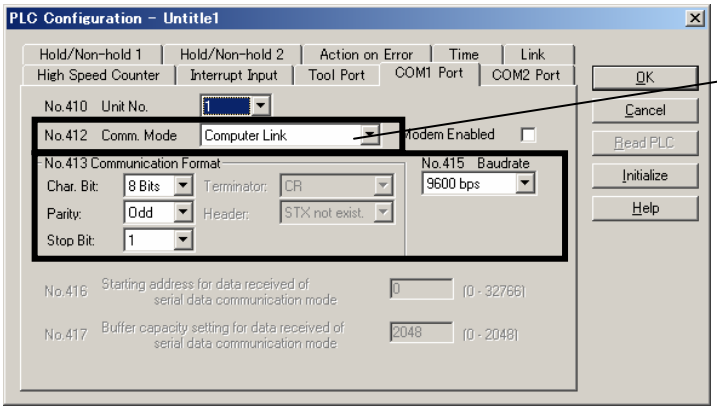


2. The window below will be displayed.

Select “Tool port setting” when connecting to the tool port or “COM port setting” when connecting to the COM port. Please match the transfer format and transmission speed settings to those of the GT.



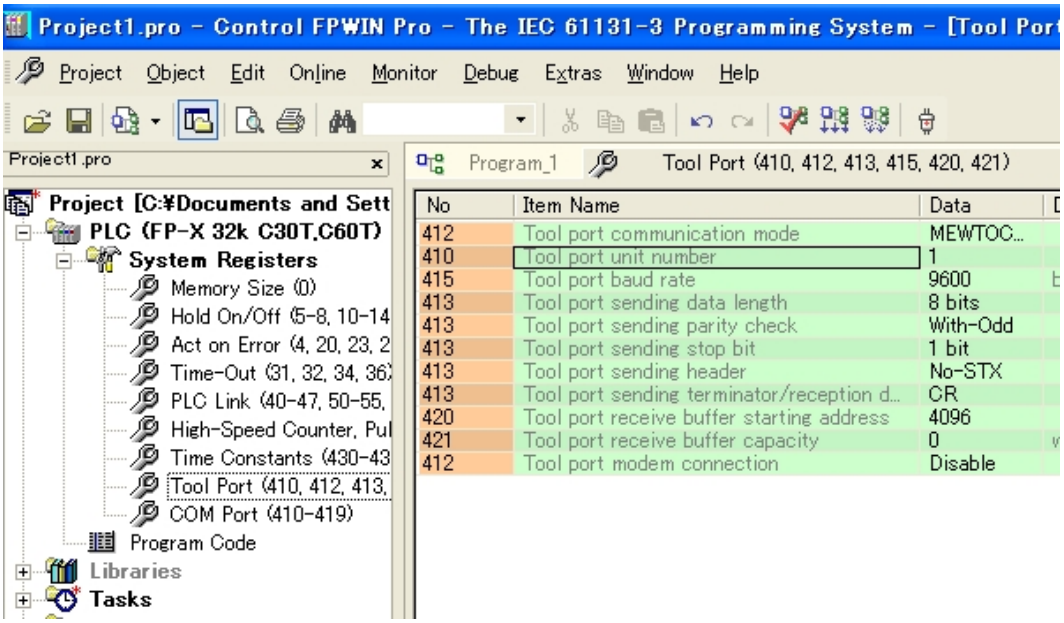
In addition to the transfer format and transmission speed settings, set the communication mode to “Computer link” when using the COM port.



Select “Computer Link”.

FPWIN Pro

To make communication settings in FPWIN Pro in the Project Navigator: PLC→System Register→Tool Port.


Project1.pro - Control FPWIN Pro - The IEC 61131-3 Programming System - [Tool Port
Project Object Edit Online Monitor Debug Extras Window Help
Project1.pro
Project [C:¥Documents and Sett
PLC (FP-X 32k C30T,C60T)
System Registers
Memory Size (0)
Hold On/Off (5-8, 10-14
Act on Error (4, 20, 23, 2
Time-Out (31, 32, 34, 36)
PLC Link (40-47, 50-55,
High-Speed Counter, Pul
Time Constants (430-43
Tool Port (410, 412, 413,
COM Port (410-419)
Program Code
Libraries
Tasks
Program_1
Tool Port (410, 412, 413, 415, 420, 421)
No Item Name Data
412 Tool port communication mode MEWTOC...
410 Tool port unit number 1
415 Tool port baud rate 9600
413 Tool port sending data length 8 bits
413 Tool port sending parity check With-Odd
413 Tool port sending stop bit 1 bit
413 Tool port sending header No-STX
413 Tool port sending terminator/reception d... CR
420 Tool port receive buffer starting address 4096
421 Tool port receive buffer capacity 0
412 Tool port modem connection Disable

For details, please refer to the online help.

Chapter 5

GT Configuration Settings

5.1 GT Configuration Settings

5.1.1 Factory Default of GT Configuration Settings

The GT has an internal file called the “Configuration file”, which is used to determine various operating environment parameters. When the GT is shipped from the factory, the settings listed below are set for the parameters in the configuration setting file.

Factory settings of Configuration settings

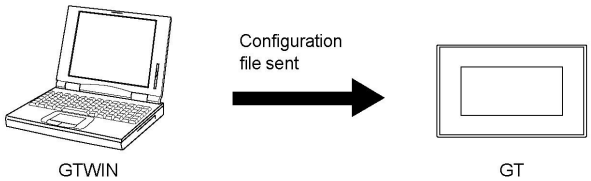
Classification	Item	Setting contents
Basic setup	Area for basic communicaton with PLC	PLC model: Matsushita Electric Works, Ltd MEWNET-FP series Word area: DT0 to DT2 Bit area: WR0 to WR2
Communication parameter settings	COM port	Baud rate: 9600 bps, data length: 8 bits, stop bit: 1 bit, parity: odd <Communication error temporary processing> Retries: 3 times, error code displayed (not held)
	TOOL port (GT01/GT11/GT21/ GT30)	Baud rate: 115200 bps, data length: 8 bits, stop bit: 1 bit, parity: odd <Through function local setting> None
Auto paging	Automatic paging	No
Startup screen settings.	Startup screen	No. 00
	Rise delay time	0 seconds
Other settings	Backlight control	Not turned off automatically
	Touch operation sounds	Valid

5.1.2 Changing GT Configuration Settings

There are the following two methods to change the GT configuration settings.

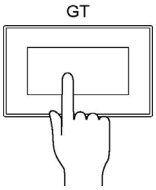
1. Entering configuration settings from GTWIN screen creation tool

With this method, GT configuration settings are entered from GTWIN screen creation tool, and the GT configuration file is sent to the GT. Most items can be set using this method.



2. Entering configuration settings fron the system menu

Some of the settings, such as the communication parameters, the internal clock, and adjustments of the liquid crystal display contrast, can be set using the system menu of the GT. Settings are entered using the touch switches on the front of the panel.



Most of the items can be set by the above 1, but some items can be set only in the system menu of the GT. For the details, refer to the list of GT configuration settings..

List of GT Configuration Settings A: Available N/A: Not available

		GT01	GT11	GT21	GT30	GT32M	GT32T*	GT05
Items that can be set from GTWIN	Title setting	A	A	A	A	A	A	A
	Type of PLC connected	A	A	A	A	A	A	A
	Basic communication area to PLC	A	A	A	A	A	A	A
	Communication parameters	A	A	A	A	A	A	A
	Auto-paging screen settings	A	A	A	A	A	A	A
	Startup screen (default screen) settings	A	A	A	A	A	A	A
	Reference destination setting for clock	A	A	A	A	A	A	A
	Backlight control	A	A	A	N/A	N/A	N/A	A
	Touch sounds	A	A	A	A	A	A	A
	Hold PLC device	N/A	A	A	A	A	A	A
	GT internal device hold	N/A	A	A	A	A	A	A
	Sound Note)	N/A	N/A	N/A	N/A	A	A	N/A
Items that can be set either way	Communication parameters	A	A	A	A	A	A	A
Items that can be set from the GT system menu	LCD contrast setting	A	A	A	A	N/A	N/A	A
	Memory initialization	A	A	A	A	A	A	A
	Self-diagnosis	A	A	A	A	A	A	A
	Clock division setting for the GT clock	N/A	A	A	A	A	A	A
	Adjustment of the analog touch pane	A	A	A	N/A	A	A	A
	Copy	A	A	A	N/A	N/A	N/A	N/A

Note) It is the function for the GT32T1.

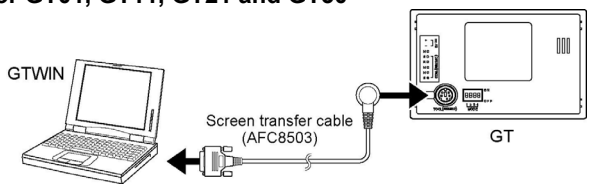
"Basic communication area to PLC" under "Basic Setup"
This is an internal device area that comes already provided in the GT for the purpose of communicating with a PLC. If the factory settings are to be changed, the **confirmation and setup** procedure must be carried out.

Reference: <5.5 Basic Communication Area Between the GT and PLC>

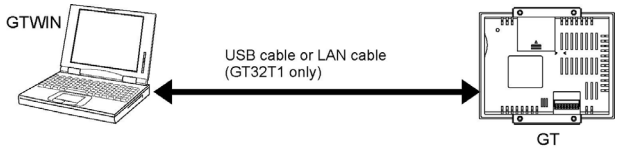
5.1.3 Flow of Entering Configuration Settings from Screen Creation Tool "GTWIN"

1. Set the GT configuration settings wih the GTWIN (GT configuration settings)
2. Connect the GT and the personal computer

For GT01, GT11, GT21 and GT30



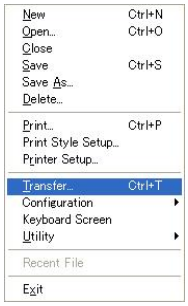
For GT32 and GT05

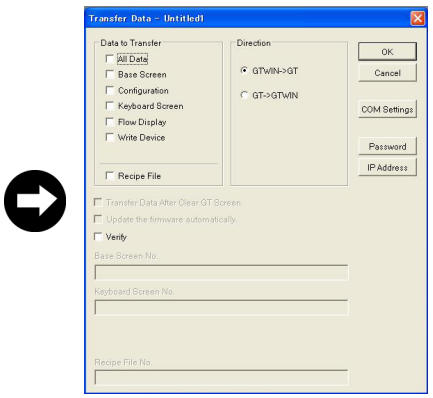


3. Transfer the GT Configuration file from GTWIN

After connections have been completed, use the following procedure to transfer the GT Configuration file from GTWIN.

- Boot GTWIN, and select "Transfer" on the "File" menu.

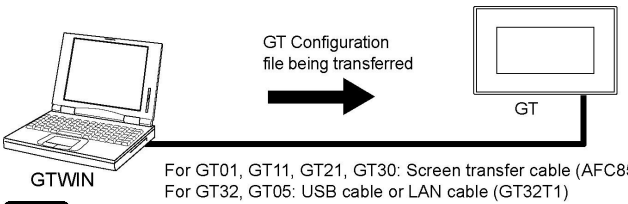




- When the transfer function is selected, a dialog box for file transfer is displayed. At this point, specify the type of data to be transferred, and the direction of transfer.
  Transfer data: "GT Configuration"
  Transfer direction: "GTWIN → GT"
  Enter the above conditions and click on the "OK" button. The system files are transferred to the GT.

When the menu oepration as above is carried out, the configuration file sent to the GT. During the transfer, a screen like that shown below is displayed.
The firmware of the main unit of GT can be updated to the latest version by using the above-mentioned transfer function.

Reference: <5.4 GT version upgrade >


GT Configuration
file being transferred
GT
GTWIN
For GT01, GT11, GT21, GT30: Screen transfer cable (AFC8503)
For GT32, GT05: USB cable or LAN cable (GT32T1)

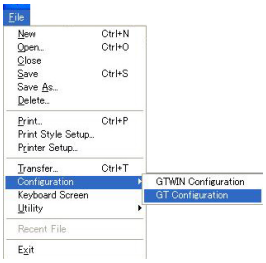
Note:
Backup of the GT Configuration file
The GT Configuration file is stored in the user memory (F-ROM) of the GT. This file is deleted if the memory is initialized using the command on the system menu of the GT, and will have to be transferred again.

5.2 Configuration Settings in “GTWIN”

This section describes how configuration settings for the GT are entered from the screen creation tool “GTWIN”.

Opening the GT Configuration Settings

The GT configuration settings are set by selecting [Configuration] on the menu displayed by clicking with the mouse on [File] or pressing the Alt + F keys. Then select the “GT Configuration” sub-menu under [Configuration].



Configuration Settings

GTWIN Configuration: These are operating environment settings for GTWIN.

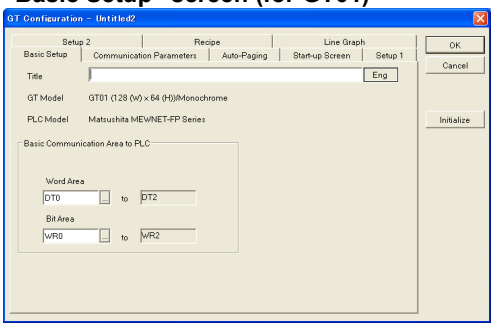
GT Configuration: These are configuration settings for the GT. The file is sent from GTWIN to the GT after the settings have been entered.

5.2.1 Basic Setup

Selecting [Configuration] on the [File] menu of GTWIN and then the sub-menu [GT Configuration] displays the “Basic Setup” screen shown below.

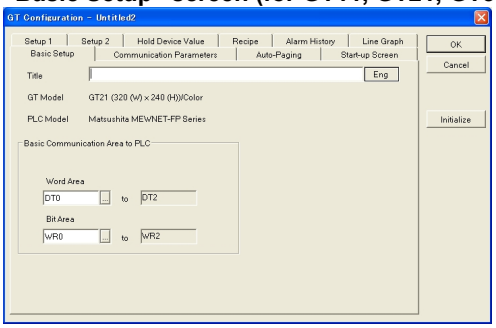
This is used to specify the basic communication area used for communication between the GT and PLC, and the environment required for the GT operation.

“Basic Setup” screen (for GT01)

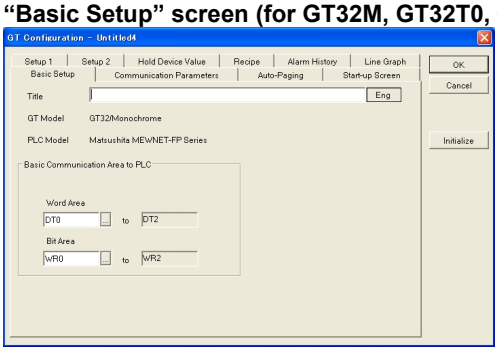


The [Hold PLC device] and [Alarm history] settings are not available for GT01.

“Basic Setup” screen (for GT11, GT21, GT30)

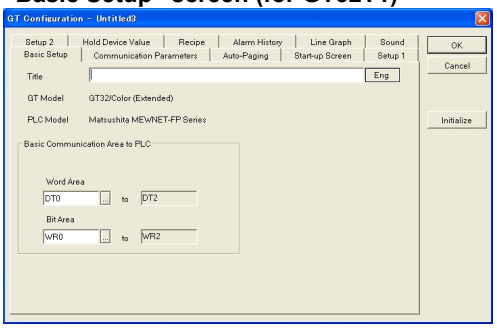


“Basic Setup” screen (for GT32M, GT32T0, GT05)



Note) The [Sound] setting is not available.

“Basic Setup” screen (for GT32T1)



- **Title:** The title of the configuration settings file is entered here. Titles are convenient if each GT has its own configuration settings.
- **PLC Model:** The model of PLC specified when GTWIN is booted is displayed here.
- **GT Model:** The model of GT specified when GTWIN is booted is displayed here.
- **Basic Communication area to PLC:** This is used to specify the mode in which communication takes place between the GT and PLC, and the internal PLC device used for basic communication.

Device used

This specifiesthe internal PLC device used for basic communication between the GT and PLC.

Explanation of this function:

Standard settings

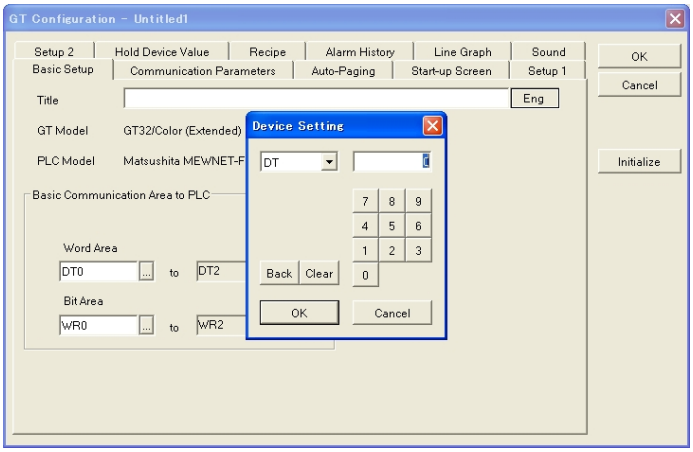
Clicking on the Initialize button in the “GT Configuration” dialog box displays the following message. Clicking on [OK] sets the default values (the configuration settings entered when the unit is shipped) for all of the settings.

Reference: <5.1.1 Factory Default of GT Configuration Settings >

5.2.2 Basic Communication Area with PLC

Specify the internal PLC device used for basic communication.
Select “Configuration” under “File” on the menu bar, and then select the sub-menu called “GTWIN Configuration”. This displays the dialog box for the GT Basic Setup, as shown below.

GT Configuration Basic Setup dialog box



Word area: This specifies the type of device that reads and writes screen numbers and other information in word units, and the initial address.

Bit area: This specifies the type of device that reads and writes backlight control and other bit information, and the initial address.

The type of device and addresses can be set by clicking on the buttonsfor the various items.

Device settings dialog box

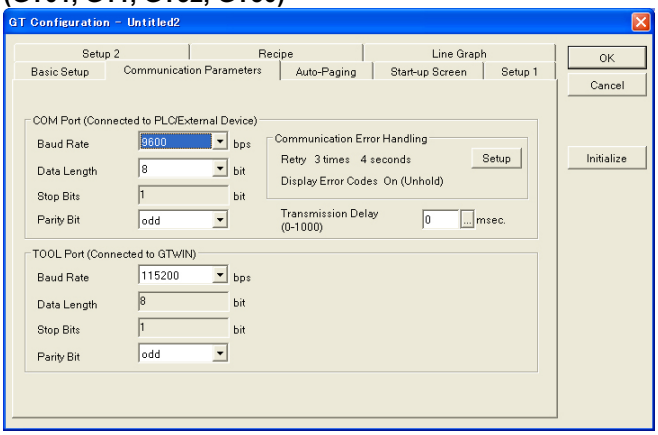
Clicking on the button displays a pull-down menu. Select the device for which settings are to be entered, and use the ten-keys to enter addresses. The Back button functions as a backspace key when entering addresses. The Clear button acts as a Clear key.

Reference: <5.5 GT01 Basic Communication Area Map>

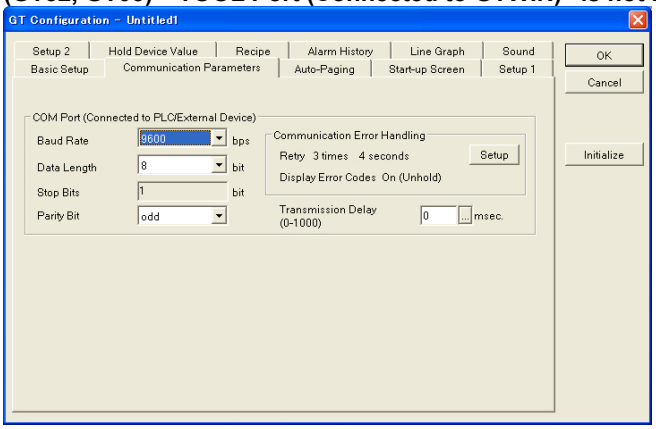
5.2.3 Communication Parameters

Clicking on the “Communication Parameeers” tab in the “GT Configuration” dialog box displays the following screen. This is where communication parameters for the PLC and personal compuer (GTWIN) connected to the GT are set.

“Communication Parameters” screen
(GT01, G11, GT32, GT30)



(GT32, GT05) “TOOL Port (Connected to GTWIN)” is not indicated.



COM port (Connected to PLC/External device)
This is used to specify the baud rate and transmission format whenthe GT is connected to an external device (PLC).

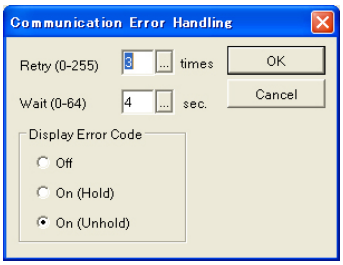
Clicking on the ▼ button displays a pull-down menu from which the value to be set can be selected.

- **Baud rate:** Select 9600, 19200, 38400, 57600 or 115200.
- **Data length:** Select either “7 bits” or “8 bits”.
- **Stop bit:** This is fixed at “1 bit”.
- **Parity:** Select “None”, “Odd” or “Even”.

Handle communication error

Clicking on the Setup button displays the “Communication Error Remedy” dialog box. This is used to specify the processing to be used if a communication error occurs.

“Communication Error Remedy” dialog box



For “Retry” and “Waiting”, click the button and specify the values in the “Value Set” dialog box that is displayed.
For “Display Error Code”, select “Off”, “On (Hold)”, or “On (Unhold)” by clicking the radio button of the desired value to turn it on.

- **Retry:** This specifies the number of retries if a communication error occurs. The setting range is from 0 to 255 times.
- **Waiting:** This specifies the interval between retries if a communication error occurs. The setting range is from 0 to 255 seconds.

Display error code

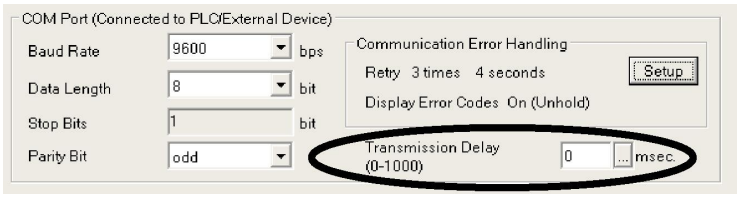
This switches the setting for the error code display used if a communication error occurs.

- **Off:** No error code is displayed if a communication error occurs.
- **On (Hold):** An error code is displayed at the upper right of the screen if a communication error occurs, and continues to be displayed until the power supply is turned off.
- **On (Unhold):** An error code is displayed at the upper right of the screen if a communication error occurs, and is cleared when the cause of the error is eliminated.

Reference: <Chapter 8 Troubleshooting>

Time until sending data

The time taken to send the next data from receiving data from an external equipment can be adjusted with the GT. The delay time longer than the preset value can be held by specifying the time until sending data. Set it when the external equipment cannot receive data properly as data transmission is too quick from the GT. The setting range is 0 to 1000 ms.



TOOL port (for GTWIN connection)
This is used to specify the baud rate and transmission format whenthe GT is connected to a personal computer (GTWIN).

Clicking on the button displays a pull-down menu from which the value to be set can be selected.

- **Baud rate:** Select 9600, 19200, 115200 or 230400.
- **Data length:** This is fixed at “8 bits”.
- **Stop bit:** This is fixed at “1 bit”.
- **Parity:** Select “None”, “Odd” or “Even”.

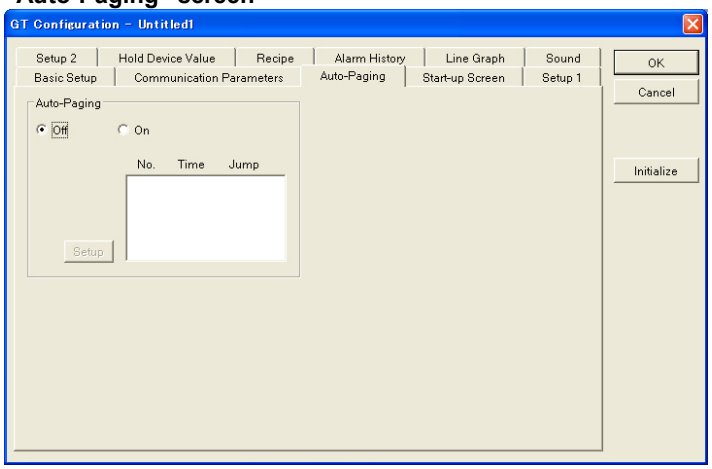
Note:
There is no TOOL port setting in the GT32 and GT05. Only communication with USB port or Ethernet port (GT32T1 only) is available.

When the baud rate is set to 230400 bps:
- It can be used when the GT01, GT11 or GT21 is connected with the USB/RS232C conversion cable.
- It cannot be connected by the automatic communication function in the GTWIN

5.2.4 Auto-Paging

Clicking on “Auto-Paging” in the “GT Configuration” dialog box displays the screen shown below. Here, settings can be entered for a function that automatically switches the screens displayed on the GT.

“Auto-Paging” screen



Auto-paging

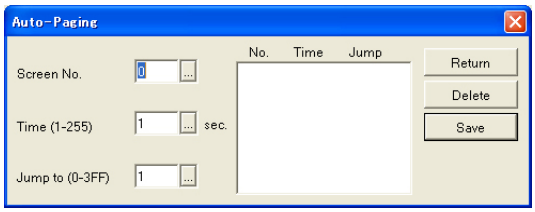
This is used to specify the “Auto-paging function”, which automatically switches the specified screen when a given period of time has elapsed.

- **Off:** The screen is not switched automatically.
- **On:** The screen is switched automatically, in conformance with the specified contents.

Auto-paging settings

If “On” is selected for auto-paging, and the [Setup] button is clicked, a dialog box containing the following auto-paging settings is displayed.

Clicking on the button for “Screen No.”, “Time”, or “Jump to” displays a “Value Set” dialog box. Set the value and click the [Save] button to save values one at a time.

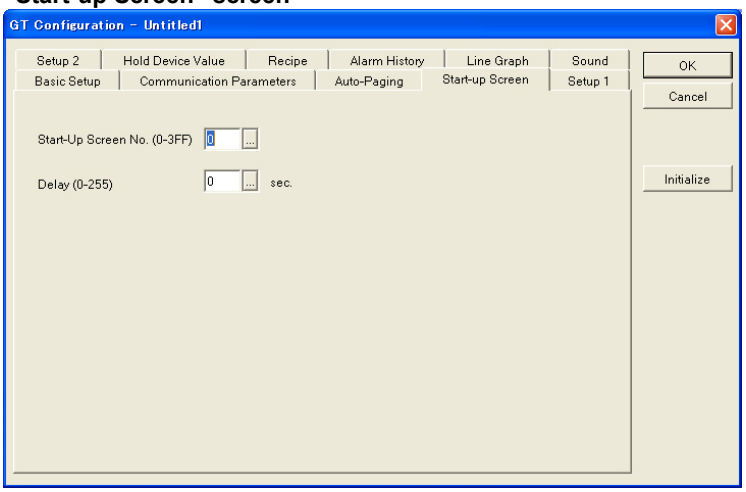


- **Screen No.:** This specifies the screen targeted for auto-paging.
- **Time:** This specifies the time for which the screen specified above is displayed. The setting range is from 1 to 255 seconds.
- **Jump to:** This specifies the number of the next screen to be displayed.
- **[Return]:** This completes the auto-paging settings and returns to the “Auto-Paging” dialog box.
- **[Delete]:** This deletes screens registered for auto-paging.
- **[Save]:** This saves the settings for the screen number, time, and jump destination as auto-paging settings.

5.2.5 Startup Screen Settings

Clicking on “Start-up Screen” in the “GT Configuration” dialog box displays the screen shown below. Here, the screen displayed when the GT is booted can be specified.

“Start-up Screen” screen



This is used to specify the screen that will be displayed when the GT is booted, as well as the time it will be displayed. Clicking on the button for each of the items displays a “Value Set” dialog box where the values can be specified.

- **Start-up Screen:** This specifies the number of the screen that will be displayed when the GT is booted. Clicking on the button displays a “Value Set” dialog box where the value for the start-up screen number can be specified.
- **Display time:** This specifies the time for which the startup screen specified above will be displayed. The value can be set to any number between 0 and 255 seconds. Clicking on the button displays a “Value Set” dialog box where the start-up delay time can be specified.

Key Point:

- When the above settings are entered, the screen specified with the “Startup Screen” parameter is displayed for the amount of time specified with the “Display Time” parameter.
- When the amount of time specified with the “Display Time” parameter elapses, the screen corresponding to the number stored in the initial address of the word device under “Basic Communication Area to PLC” in the Basic Setup” parameters under “GT Configuration” will be displayed.
- This function is used when it is necessary to delay the start-up time when the power supply on the PLC side is turned on.

Note:

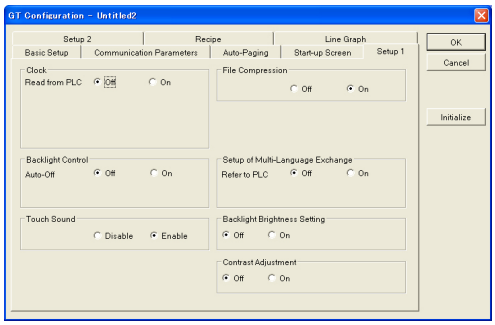
- Communication between the GT and the PLC (external device) cannot be carried out during the time specified by the “Display Time” parameter. Therefore, the switch part nor lamp part will not be displayed even if they are pasted on the start-up screen.

5.2.6 Setup 1

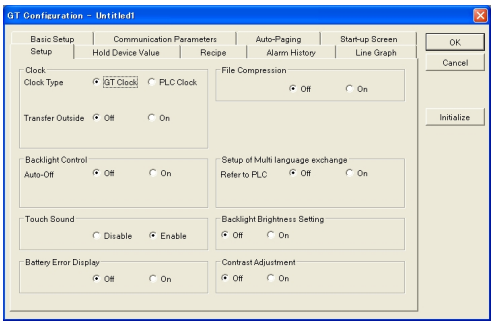
Clicking on the “Setup 1” tab in the “GT Configuration” dialog box displays the screen shown below. Here, clock functions, backlight control, and other parameters can be specified.

“Setup 1” screen

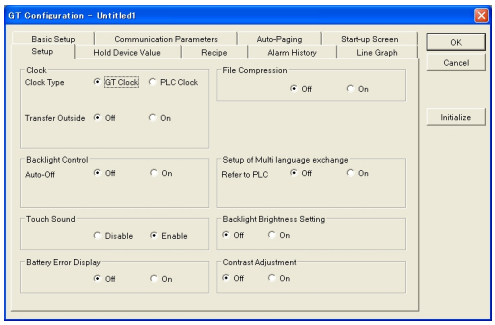
GT01



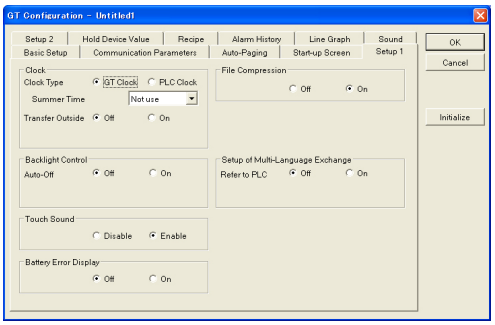
GT11 and GT21



GT30



GT32 and GT05



“Setup 1” screen		GT01	GT11	GT21	GT30	GT32	GT05
Clock	Read from PLC	A	A	A	A	A	A
	GT clock	N/A	A	A	A	A	A
	Summer time	N/A	N/A	N/A	N/A	A	A
	Transfer outside	N/A	A	A	A	A	A
Backlight control		A	A	A	A	A	A
Touch sound		A	A	A	A	A	A
Battery error display		N/A	A	A	A	A	A
File compression		A	A	A	A	A	A
Press two touch switches		N/A	N/A	N/A	A	N/A	N/A
Setup of multi language exchange		A	A	A	N/A	A	A
Backlight brightness setting		A	A	A	N/A	N/A	A
Contrast adjustment		A	A	A	N/A	N/A	N/A

A: Available N/A: Not available

Clock

This is used to specify the reference destination for the clock displayed with the GT. Select one of the radio buttons.

GT Clock	When the time is displayed, the internal clock in the GT is used as a reference for the value.
PLC Clock	When the time is displayed, the internal clock in the PLC is used as a reference for the value.

If the “PLC Clock” is referenced for the clock setting, clicking on the [...] button displays a screen where the type of device and the address can be specified.

Device Setting dialog box

Click on the [▼] button to display the pull-down menu, and select the device from that menu. Enter the address using the ten-keys.

The [Back] button functions as a backspace key when entering addresses.
The [Clear] button acts as a Clear key.

The following table shows the clock data referred.

Reference sequence of clock data

Address	Upper byte	Lower byte
Top address	Minutes data (H00 to H59)	Second data (H00 to H59)
Top address + 1	Day data (H01 to H31)	Hour data (H00 to H23)
Top address + 2	Year data (H00 to H99)	Month data (H01 to H12)
Top address + 3	-	Day data (H00 to H06)

Note) In the day data, H00 indicates Sunday and H06 indicates Saturday.

Summer time

This is used to set the standard summer time (daylight saving time) in USA or Europe.

Not use	Summer time (daylight saving time) is not used.
Use (USA)	Summer time (daylight saving time) in USA is used. (From 2:00 AM on the 2nd Saturday of Mar. to 2:00 AM on the 1st Sunday of Nov.)
Use (Europe)	Summer time (daylight saving time) in Europe is used. (From 1:00 AM on the last Sunday of Mar. to 1:00 AM on the last Sunda of Oct.)

Transfer Outside

Clock data displayed in the GT can be transferred to an external device such as a PLC, using this setting.

Off	The GT clock data is not transferred to an external device.
On	The GT clock data is transferred to an external device.

If “On” is selected for the above “Transfer Outside” parameter, click on the [...] button to specify the output destination and the initial device, and specify the address.

Transfer sequence of clock data

Address	Upper byte	
Top address	Minutes data (H00 to H59)	Second data (H00 to H59)
Top address + 1	Day data (H01 to H31)	Hour data (H00 to H23)
Top address + 2	Year data (H00 to H99)	Month data (H01 to H12)
Top address + 3	-	Day data (H00 to H06)

Note) In the day data, H00 indicates Sunday and H06 indicates Saturday.

Note:

If “On” is selected for the “Transfer Outside” parameter, the data will be transferred to the DT90054 as the default device. If this device address does not exist in the PLC connected to the GT, howefver, re-specify the address so that it matches the model connected to the GT.
Selecting a device address that does not exist in the PLC will cause an error (ER61) to occur.

Backlight control

Auto-Off

This is used to specify the Auto-Off backlight feature.

Off	The Auto-Off backlight feature is not used.
On	Auto-Off backlight feature is used. This parameter specifies the period of time that the GT is inactive before the backlight goes off automatically.

If “On” is set for the above Auto-Off backlight feature, clicking on the button displays a screen where the time until the backlight goes off can be specified. Any time from one minute to 30 minutes can be specified.

Key Point:

If the backlight is turned off automatically using the backlight control function, touching the screen turns it on again. If a touch switch happens to be located at that point on the screen, it will be invalid until the backlight has gone on again.

Touch Sounds

This sets the touch sounds corresponding to GT screens as either invalid or valid. Select one of the radio buttons.

Disable	Touch sounds are disabled.
Enable	Touch sounds are enabled.

Battery Error Display

For GT11/GT21/GT32/GT05

This specifies whether or not a dead battery mark will be displayed on the GT screen if the voltage of the internal battery drops too low or the battery is dead.

Off	The dead battery mark ( ) is not displayed.
On	The dead battery mark ( ) is displayed.

* The BAT and BAT LOW flags in the basic communication area map activate in the both cases that the battery error display is set to “On” and “Off”.

For GT30

This specifies whether or not a battery change mark will be displayed if the voltage of the internal battery drops too low, and whether or not a dead battery mark will be displayed if the battery is dead on the GTscreen. Select one of the radio buttons.

Off	The batery change mark ( ) or the dead battery mark ( ) is not displayed.
On	The batery change mark ( ) or the dead battery mark ( ) is displayed.

* The BAT and BAT LOW flags in the basic communication area map activate in the both cases that the battery error display is set to “On” and “Off”.

File Compression

This is used to compress the screen data to transfer to the GT. More screens can be registered using the File Compression. (The switching rate of some screens may get slower. Verify the switching rate trying actually.)

Off	Screen data is not compressed.
On	Screen data is compressed.

Press Two Touch Switches

Disable	Two points cannot pressed.
Enable	Two pionts can be pressed.

Setup of Multi language exchange

This is used if you want to change the language to be displayed from the PLC side.

Off	PLC is not referred.
On	The specified PLC is referred.

Backlight brightness setting

This is used to specify whether to transfer data to the GT with or without the backlight brightness adjustment. Select either one of the radio buttons. When setting it to "on", the setting value (0 to 14) can be specified.

Off	The backlight brightness is not adjusted.
On	Transfer data after the backlight brightness has been adjusted.

Contrast adjustment

This is used to specify whether to transfer data to the GT with or without the contrast adjustment. Select either one of the radio buttons. When setting it to "on", the setting value (0 to 14) can be specified.

Off	The contrast is not adjusted.
On	Transfer data after the contrast has been adjusted.

Reference:

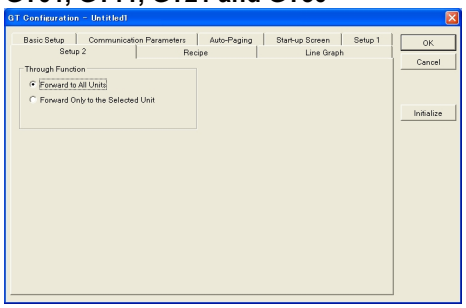
For details on Multi language exchange function, <Terminal GTWIN Operational Guide Book ARCT1F357E>, <GTWIN HELP>

5.2.7 Setup 2

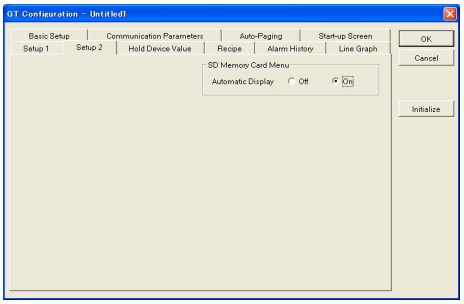
Clicking on the “Setup 2” tab in the “GT Configuration” dialog box displays the screen shown below.

“Setup 2” screen

GT01, GT11, GT21 and GT30



GT32 and GT05



A: Available N/A: Not available

“Setup 2” screen	GT01	GT11	GT21	GT30	GT32	GT05
Through function	A	A	A	A	N/A Note)	N/A Note)
SD memory card menu	N/A	N/A	N/A	N/A	A	A

Note) The through function can be used, and the setting on the GTWIN is not required.

Through function

If the “Forward only to the selected unit” check box is turned on, communication can be carried out via the through function only with unit numbers for a PLC received from a higher-order personal computer or higher-order PLC.

SD memory card menu

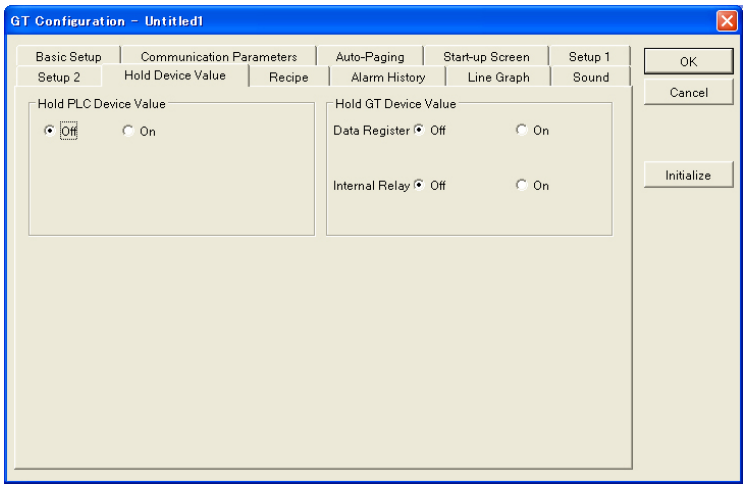
This is used to set to display the SD memory card menu automatically when a SD memory card was inserted.

Off	The menu is not displayed automatically.
On	The menu is display automatically.

5.2.8 Hold Device Value

Clicking on the “Hold PLC Device” tab in the “GT Configuration” dialog box displays the screen shown below. “Hold PLC Device” is a function that enables internal PLC device values to be held on the GT side. “Hold GT Device” is a function that holds the values for an internal device (GDT or GWR) in the GT.

“Hold Device value” screen



Hold PLC Device

The Hold PLC Device function reads the values for the specified internal PLC device to the SRAM in the GT, and tacks up the values.

Off	PLC devices are not held.
On	PLC devices are held. (up to 24 words)

If “On” is selected for the above Hold PLC Device setting, “Device” and “Number of Word” parameters are displayed. Clicking on the button displays a dialog box like that shown below, where the type of initial device, the address, and the number of words can be specified.

Device Setting dialog box

Click on the button to display the pull-down menu, and select the device from that menu. Enter the address using the ten-keys.

The Back button functions as a backspace key when entering addresses. The Clear button acts as a Clear key.

Note:

- Data for PLC devices held in the GT will be written to the internal PLC device the next time that the power supply is turned on.
- The data held for the internal PLC device is backed up by means of a lithium battery. The service life of the battery is approximately two years.

Reference: <3.5 Servicing and Maintenance>

Hold GT Device

"Hold GT Device" is a function that backs up the values for an internal device (GWR or GDT) in the GT.

Data register

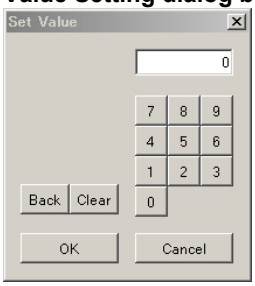
Don't hold	The GT internal device hold function is turned off.
Hold	The GT internal device hold function is turned on.

Internal relay

Don't hold	The GT internal device hold function is turned off.
Hold	The GT internal device hold function is turned on.

If the above setting for the Hold GT device function is set to "On", a "Start No." item is displayed. Click on the [...] button to display the value setting dialog box shown below, and specify a starting number. After the setting has been entered, the contents of any addresses subsequent to the specified value will be held.

Value Setting dialog box



Enter the starting number, using the ten-key pad.

The Back button functions as a backspace key when entering addresses. The Clear button acts as a Clear key.

Note:

GT internal device

Device type		Address range	Points
Memory	Data register	GDT0000 to GDT2047	2048 words
	Internal relay	WGR0000 to WGR0255	256 words
Bits	Internal relay	GR0000 to GR255F	4096 points

Note) The WGR and GR are the same memory, but in the WGR, bits are handled in word units.

- The data held for the internal PLC device is backed up by means of a lithium battery.
  The service life of the battery differs depending on the models.

Reference: <3.5 Servicing and Maintenance>

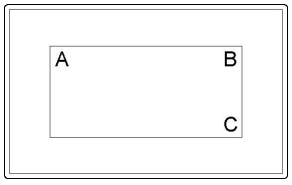
5.3 Entering Configuration Settings from GT

What is the System Menu?
The system menu is a dedicated screen for specifying the configuration settings of the GT with the tuouch panel.
Some of the items that can be specified here can also be set using GTWIN screen creation tool and then sent to the GT, but others, such as the adjustments to the LCD contrast level, can only be set using the system menu. This section explains how configuration settings are entered using the system menu.

5.3.1 Bringing Up the System Menu

The following procedure is used to bring up the system menu

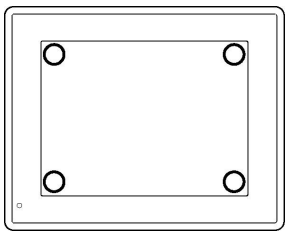
1. Touch the LCD touch panel as the following procedure.
For GT01, GT05, GT11, GT21 and GT32



1. Press the upper left corner (area A) for at least two seconds.
2. Next, immediately press the upper right corner (area B) and lower right corner (area C), in that order.

* Press areas A, B and C, in order, individually. It will not work if you press them together.
* For vertical type displays, arrange the GT vertically and, press the top left corner, top right corner and bottom right corner in order.
* The System Menu does not support vertical type displays. It will display the same as on the horizontal type.

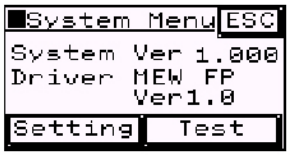
For GT30



1. Touch four corners at the same time, and continue pressing them for about one second.

2. The initial screen of the system menu is displayed.

The screen of the system menu varies depending on the GT models.
The following is explained using the GT01 screen.



"System Ver" indicates the ROM version of the GT system.

The initial screen of the system menu is displayed on the GT. Touching either the [Setting] or [Test] key shifts to the next screen.
Touching the [ESC] key exists the system menu and returns to the normal operating mode.

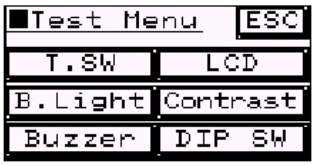
Note) There is no screens for selecting the setting mode and test mode in the initial screens of the GT21 and GT30.

3. Select the mode.

[Setting] Setting mode initial screen

This is where configuration settings for the GT, such as the contrast, clock, and memory, are specified.
Please refer to the table bloew for the information on the available settings for each model.

[Test] Test mode initial screen



This is where GT configuration elements such as the touch switches, backlight, clock, buzzer, LCD, contrast, and memory are tested.

Available functions for each model

Function name	GT01	GT11	GT21	GT30	GT32M	GT32T	GT05
Communication parameters COM port	A	A	A	A	A	A	A
Communication parameters TOOL port	A	A	A	A	N/A	N/A	N/A
Communication parameters Ethernet port	N/A	N/A	N/A	N/A	N/A	A	N/A
Clock	N/A	A	A	A	A	A	A
Contrast	A	A	A	A	A	N/A	A
Backlight	A	A	A	N/A	N/A	N/A	A
Touch switch adjustment	A	A	A	N/A	A	A	A
Memory initialization S	A	A	A	A	A	A	A
Memory initialization F	A	A	A	A	A	A	A
Copy	A	A	A	N/A	N/A	N/A	N/A
SD memory card	N/A	N/A	N/A	N/A	A	A	A

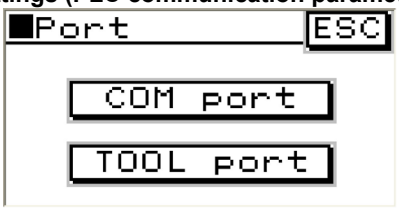
A: Available N/A: Not Available

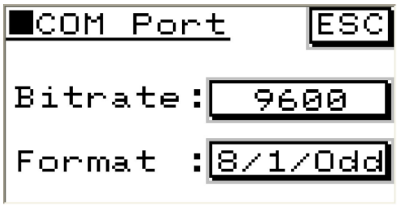
5.3.2 Setting Mode “Communication Parameters”

Touching the [Setting] Key on the initial screen of the system menu and then touching the [Port] key on the setting mode menu displays the port selection screen. Then, selecting the [COM Port], [TOOL Port] or [Ethernet Port] displays the communication parameter setting screen for each prot. Here, parameters controlling communication between the PLC and personal computer (GTWIN) connected to the GT are specified.

COM port communication parameter settings (PLC communication parameter settings)

Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[Port]
↓
[COM Port]





Bitrate: PLC baud rate

This sets the baud rate for communication with an external device (PLC) connected to the GT.
Each time the [Function] key is pressed, the baud rate switches in the sequence of 9600, 19200, 57600, 115200. Set the baud rate to match that of the PLC connected to the GT.

Format: Transmission format

This sets the communication parameters (data length, stop bits, parity) for the external device (PLC) connected to the GT.
The items displayed are: Data length/Stop bit/Parity, and each time the [Function] key is pressed, the display switches in the sequence of: [7/1None], [7/1/Odd], [7/1/Even], [8/1/None], [8/1/Odd], [8/1/Even]. Set the parameters to match those of the PLC connected to the GT.

Touch panel operation:

[Return] To complete the settings and return to the previous screen, touch the [ESC] key.

Explanation of this function:

The default values for the COM port communication parameter settings are: 9600, 8/1/Odd.

TOOL port communication parameter settings (GTWIN communication parameter settings)

Procedure for bringing up the screen

[Initial screen]

↓

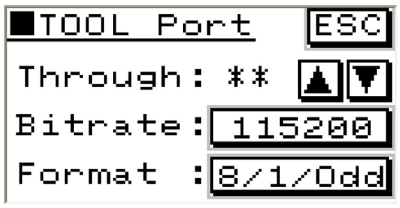
[Setting]

↓

[Port]

↓

[TOOL Port]



Through function: Through function destination setting (part)**

When the through function is being used, this specifies the number of the PLC of the connection. Normally, when used in a 1:1 configuration, this should be set to “0”.

Note:

In case of the GT32, it is displayed on the port selection screen.

Bitrate: PLC baud rate

Each time the [Function] key is touched, the baud rate switches in the sequence of 9600, 19200, 115200 and 230400*. Set the baud rate to match that of the personal computer (GTWIN) connected to the GT.

* The baud rate of 230400 is available when connecting with the USB/RS232C conversion cable.

Format: Transmission format

This sets the communication parameters (data length, stop bits, parity) for the personal computer (GTWIN) connected to the GT.

The items displayed are: Data length/Stop bit/Parity, and each time the [Function] key is pressed, the display switches in the sequence of: [8/1None], [8/1/Odd], [8/1/Even].

Touch panel operation:

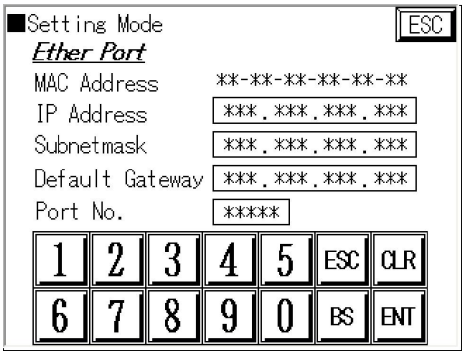
[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

Explanation of this function:

The default values for the TOOL port communication parameter settings are: 115200, 8/1/Odd.

Ethernet port communication parameter settings (GTWIN communication parameter settings)
Touching [Ethernet Port] key displays the Ethernet Port setting screen.

[Ethernet Port]



* The screen of GT32 is used.

The IP address or port No. is specified for Ethernet communication.
Touching the area of the setting value of the item to change displays the keyboard. Then set the value.

The default values are as below.

IP Address	**192.168.1.5**
Subnetmask	**255.255.255.**
Default Gateway	**192.168.1.1**
Port No.	**9094**

Note:
There are values that cannot be input for each setting of Ethernet. When such a value was entered, the error code is displayed.

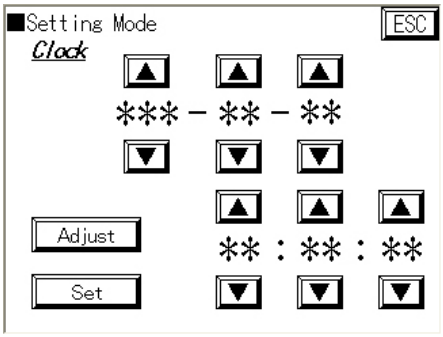
Reference: <6.4 Error Codes and How to Handle Them>

Touch panel operation:
[Return] To complete the settings and return to the previous screen, touch the [ESC] key.

5.3.3 Setting Mode “Clock Settings” (Clock)

Touching the [Clock] key in the setting menu on the initial screen of the system menu displays the clock setting screen. The internal clock of the GT is set here.

Clock setting screen
Procedure for bringing up the screen
[Initial screen]
↓
[Clock]



* The screen of GT32 is used.

The time displayed on the screen is the current time indicated by the internal clock of the GT. Items can be changed by touching the item (year, month, day, hour, minute, second) and touching the [+] and [-] keys to change the values.

Touch panel operation:
[ADJUST] Touching the [+] key increases the contrast, and touching the [-] key decreases it.

[SET] Touching the [SET] key updates the Value Set and restarts the clock. Touching the [ADJUST] key sets the seconds value of the current time to “00”. A seconds value of 0 to 29 is rounded off to the next lower value, and a seconds value of 30 to 59 is rounded off to the next upper value.
Example:
If the time is set to 12 (hours) : 35 (minute) : 29 (seconds)
→ 12 (hour) : 35 (minute) : 00 (seconds)
If the time is set to 12 (hours) : 35 (minutes) : 30 (seconds)
→12 (hour) : 36 (minute) : 00 (seconds)

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

Explanation of this function:
Setting the day
The day is set automatically, based on the year, month, and date data.

5.3.4 Setting Mode "Liquid Crystal Display Contrast Adjustment and Backlight Brightness Setting" (Contrast/Brightness)

Touching [Setting] on the initial screen of the system menu and then the [Display] ([Contrast & Brightness] for GT05, [Contract] for GT32] key of the setting mode menu displays the contrast adjustment and backlight brightness setting screen.

Contrast adjustment and backlight brighteness setting screen

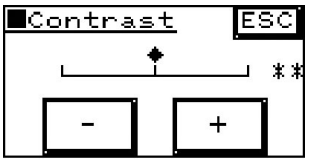
Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[Display]

Liquid crystal display contrast adjustment (Contrast)

Touching [Contrast] on the contrast adjustment and backlight brightness setting screen displays the contrast adjustment screen. The contrast of the GT LCD is adjusted here.

Contrast adjustment screen

Procedure for bringing up the screen
[Contrast adjustment and backlight brightness setting screen]
↓
[Display]
↓
[Contrast]



Touch panel operation:

[ADJUST] The value can be set in the range of 0 to 14.
Touching the [+] key increases the contrast, and touching the [-] key decreases it. The values and the ♦ mark are the value set. The standard value is 7 and when the ♦ mark is located at the center.

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

Backlight brightness setting screen

Procedure for bringing up the screen
[Contrast adjustment and backlight brightness setting screen]
↓
[Display]
↓
[Brightness]

Touch panel operation:

[ADJUST] The value can be set in the range of 0 to 14.
Touching the [+] key increases the brightness, and touching the [-] key decreases it. The values and the ♦ mark are the value set. The standard value is 7 and when the ♦ mark is located at the center.

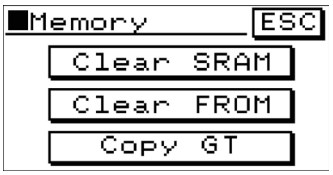
[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

5.3.5 Setting Mode "Memory Initialization" (Clear Memory)

Touching [Setting] on the initial screen of the system menu and then the [Memory] key of the setting mode menu displays the memory initialization screen. The internal user memory of the GT is initialized here.

Memory initialization and copy GT function setting screen

Procedure for bringing up the screen
[Initial screen]
↓
[Setting]
↓
[Memory]



[SRAM] Touching the [SRAM] key deletes the line graphs stored in the SRAM.
(The line graph data will be also deleted when the powe supply is turned on again.
For the GT1, GT11, GT21, GT32 and GT05, Hold PLC Device data, alarm history and the data in the GT internal device will be also deleted.

[FROM] Touching the [FROM] key deletes screen data and main unit configuration settings saved to the main unit user memory (F-ROM).

When either of the above keys is touched, a confirmation message reading [Clear OK?] is displayed. To clear the data, touch the [Clear OK?] key. A buzzer sounds, and the memory starts to be cleared, and the display changes to [Now Working]. When [Cleared] is displayed, the memory has been completely cleared. Do not turn off the power supply during [Now Working]. If the power supply is turned off, please perform to clear memory again.

Touch panel operation:
[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

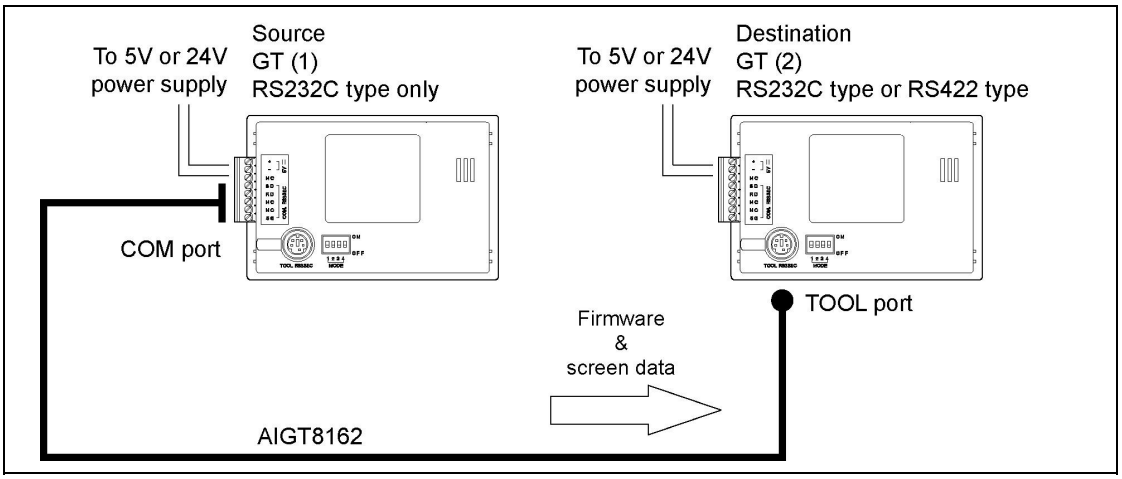
Note:
- [SRAM] initialization deletes the line graph data stored in the SRAM. Also the line graph data is not backed up, and it will be deleted when the power supply is turned off.
- [FROM] initialization deletes the base screen data, the GT configuration setting data (the GT configuration setting data returns to the default values) and contrast adjustment setting data (the contrast returns to the default value) in the user memory (F-ROM) of the main unit.

  Before initializing the F-ROM, always save screen data in a PC or another medium with GTWIN.

5.3.6 Setting Mode “Memory Initialization” (COPY GT) (GT01/GT11/GT21)

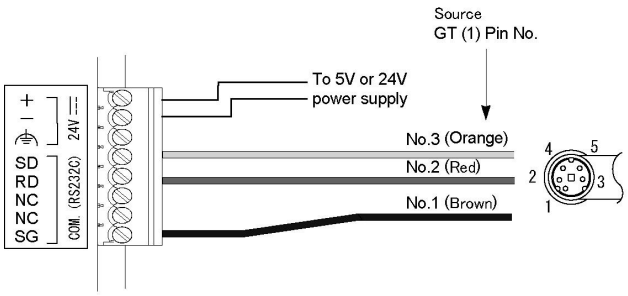
This function is used to transfer screen data connecting the GT units. Connect a cable between the COM port of the source GT that sends data and the TOOL port of the destination GT that receives the data. Operate the source GT.

Use the RS232C type as the source GT unit. (The RS422 type cannot be used as the source GT unit.)



PLC communication cable: Mini-DIN 5-pin loose-wire cable (AIGT8162)

Connecting COM port of source GT (1) with TOOL port of destination GT (2) (AIGT8162)



Source GT (1) side

Pin No.	Signal name
1	+
2	−
3	FG
4	SD
5	RD
6	NC
7	NC
8	SG

To 5V or 24V power supply

Source GT (2) side

Pin No.	Signal name
1	SG
2	SD
3	RD
4	NC
5	(+5V)

* Although no. 6 and 7 of GT11/GT21 is RS/CS, they are used in the above connections.

Note:

- **The copy GT function is only available for the same models.**
- **If the connection is incorrect, the screen data of the source GT is deleted.**

How to send screen data

Touching [Setting] on the initial screen of the system menu of the source GT and then the [Memory] key of the setting mode menu displays the selection screen for the memory initialization and copy GT function.

Selection screen for memory initialization and copy GT function

Procedure for bringing up the screen

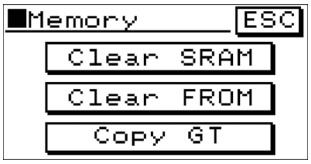
[Initial screen]

↓

[Setting]

↓

[Memory]



Touching [Copy GT] key changes the screen to the copy GT function screen.

Copy GT function screen

[Copy GT]

When [Start] key is touched, a message reading [Start OK?] is displayed. To copy the data, touch the [Start OK?] key. The following messages are displayed according to the operation states.

Message	Operations state	Measures
Initializing	The data of the destination GT is being initialized.	-
Transferring	Image data is being transferred.	
Finished	Transmission has completed successfully.	
Protected	A password has been set for the destination GT.	Cancel the password of the destination GT.
Cannot copy	The firmware of the source GT does not support the destination GT.	Check the version of the firmware of the destination GT.
Error	Communication error	Check the communication settings of the both GTs.

Touch panel operation:

[RETURN] To return to the memory initialization and copy GT function selection screen, touch the [ESC] key.

To return to the copy GT function screen, touch the [Finished] key.

Explanation:

Order of transfer between the GTs

Transferring data between the GTs is carried out in the following order.

1. Initialize the screen data of the GT (2) (if the screen data exists in the GT (2)).
2. Transfer the firmware of the GT (1) (if the version is different from the GT (2)).
3. Transfer the screen data.
4. The transfer completes.

*When the screen data does not exist in the GT (1), the firmware is transferred. If the verion is the same, finish the opeartion without trasferring the firmware.

Note:

- **Do not turn off the power supply of the main unit during data transfer.**
  Also, do not pull out the cable between the GT (1) and GT (2). The units may not be restarted.
- When a password is set for the destination GT, data transfer is not available.
- When a password is set for the source GT, the password setting is also transferred.
- The baud rate for the source GT and the destination GT must be the same. Otherwise the communication is not possible.
- If the screen data does not exist in the source GT, only the firmware is transferred. Even if the version of the firmware of the destination GT is a newer version, it is changed to the version of the source GT.

5.3.7 Setting Mode: “Touch Switch Adjustment” (Touch SW)

Touching [Setting] on the initial screen of the system menu and then the [Touch SW] ([T. SW] for the Gt01) key of the setting mode menu displays the touch switch adjustment screen. The position of the GT touch switch is adjusted here.

Touch switch adjustment screen

Procedure for bringing up the screen

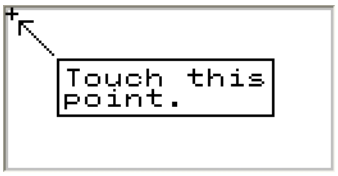
[Initial screen]

↓

[Setting]

↓

[Touch SW]



Touch panel operation:

[ADJUST] Touch the “+” mark with a soft, narrow instrument. Toucch the “+” mark three times as displayed on the screen. Please repeat if the touch position has shifted greatly. You will not lose this setting when the power is turned off. The setting will be initialized when the F-ROM memory is initialized.

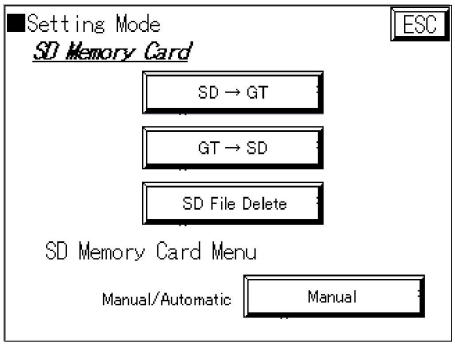
[RETURN] The adjustment should be completed to return to the previous screen.

5.3.8 Setting Mode “SD Memory Card” (For GT32 and GT05)

Touching [SD Memory Card] key of the system menu displays the setting screen. Various setting screens can be displayed by touching each key on the screen.

SD memory card setting screen

Procedure for bringing up the screen
[Initial screen]
↓
[Setting Menu]
↓
[SD Memory Card]



[SD→GT] Screen data is copied to the GT from a SD memory card.
Note) If the firmware version of the screen data saved in the SD memory card is different from the version of the GT, it is changed to the version at the time the screen data was created.
[GT→SD] The screen data of the GT is copied to the SD memory card.
[SD File Delete] The file of the screen data saved in the SD memory card is deleted.

SD Memory Card Menu
[Manual/Automatic] The screen when a SD memory car is inserted in the SD memory card slot is set.

Note:
Cautions on handling a SD memory card
It is recommended to save data in another media for backup.
Do not remove the card and turn off the power supply of the unit when the SD memory card access lamp lights up (data is being read/written into the card). Data may be damaged.

The data saved in the SD memory card may be lost in the following cases. We assume no responsibility whatsoever for the lost of saved data.

- When a user or third party used the SD memory card incorrectly.
- When the SD memory card was affected by any static electricity or electrical noise.
- When the SD memory card was removed or the power supply of other equipment was turned off while the unit was accessing the SD memory card such as saving or deleting data.

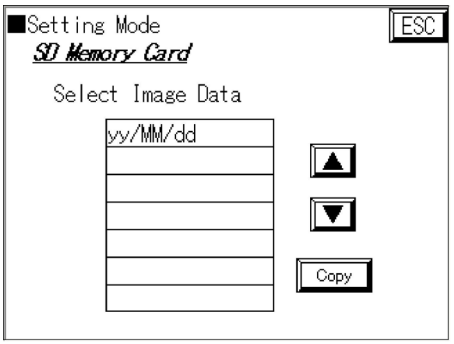
Reference: For the details of SD memory card, <GTWIN Operational Guide Book ARCT1F357E>.

SD → GT

Touching [SD→GT] key displays the screen data selectiong screen in the SD memory card. Select a file with ▲▼ keys.

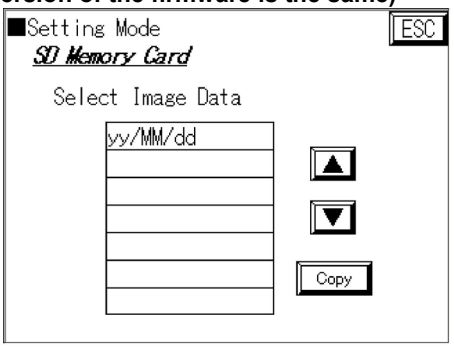
Screen data selection screen

[SD → GT]



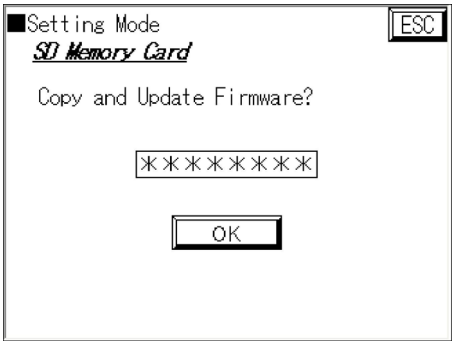
Touching [Copy] key displays the confirmation screen.

Transfer confirmation screen (when the version of the firmware is the same)



Transfer confirmation screen (when the version of the firmware is different)

Note) It is changed to the firmware version of the transferred screen data.



Touch panel operation:

[SELECT] To select a file, touch the file name. To move upward, touch ▲ key. To move downward, touch ▼ key.

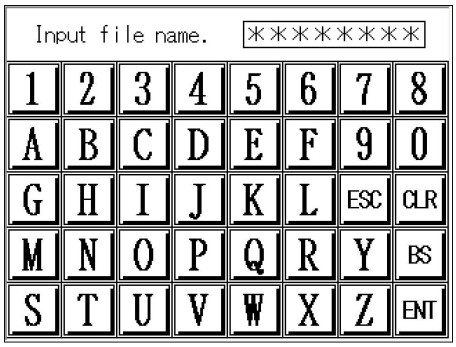
[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

GT → SD

Touching [GT→SD] key displays the [Input file name" screen to save the screen data of the GT to the SD memory card. Inptu a file name and touch [ENT] key. * Up to 8 alphanumeric letters can be input.

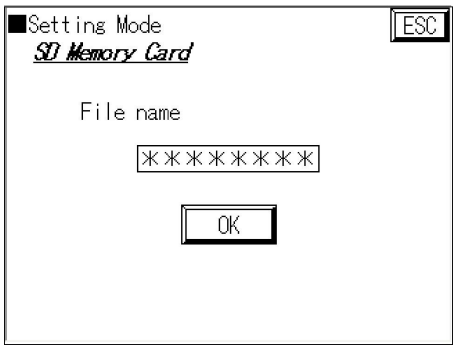
File name input screen

[GT → SD]



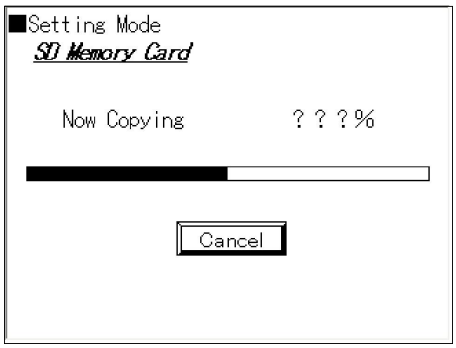
As [File name confirmation screen] is displayed. After you confirmed, touch [OK] key. (If there is any change, touch [File name] to display [File name confimation screen].)

File name confirmation screen



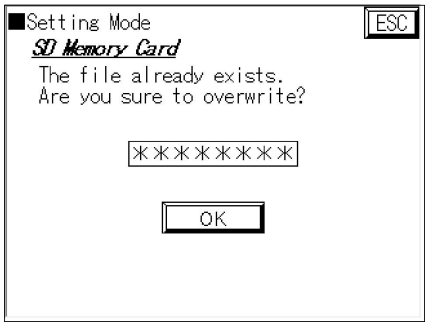
[SD memory card write screen] is displayed.

SD memory card write screen



If the same file name has been already saved, [Overwrite confirmation screen] is displayed. Touching [OK] key after saving returns to the SD card menu sreen.

Overwrite confirmation screen



Touch panel operation:

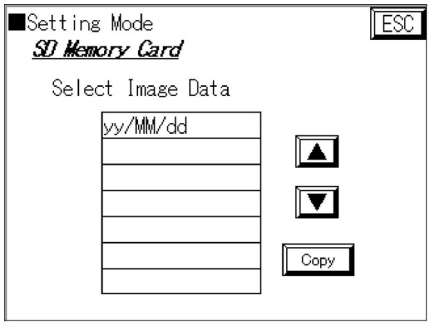
[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key.

SD File Delete

The GT32 screen data saved in the SD memory card can be deleted.
Touching [SD File Delete] key displays the screen data selectiong screen in the SD memory card. Select a file with ▲▼ keys.

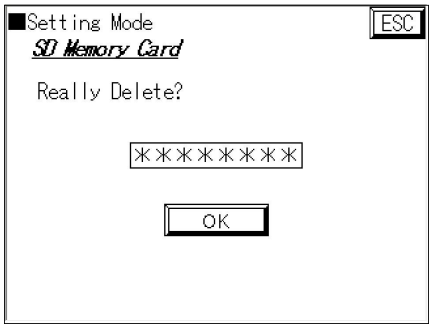
Delete file selection screen

[SD File Delete]



Touching [Delete] key displays the confirmation screen. After you confirmed, touch [OK] key. After deletion, touching [OK] key returns the SD card menu screen.

[Delete]



SD Card Menu

It is used to set whether to display the SD memory card menu or not when the SD memory card is inserted.

- [Automatic] The SD card menu is automatically displayed.
- [Manual] The SD card menu is not displayed. (Go to the SD card menu from the system menu.)

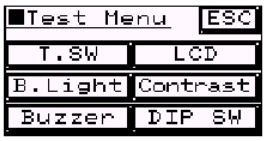
Select either [Automatic] or [Manual]. (Default is [Automatic].)

5.3.9 Setting Mode "Self-Diagnosis" (Test Mode)

Touching the [Test] key on the initial screen of the system menu displays the self-diagnosis screen. This is used to run a hardware check of the memory, buzzers, and other elements of the GT.

Test mode screen

Procedure for bringing up the screen
[Initial screen]
↓
[Test] key



Available functions for each model

Table of test modes

Test name	GT01	GT11	GT21	GT30	GT32M	GT32T
Touch switch	A	A	A	A	A	A
DIP switch	A	A				
Backlight color	A	A	A	A	A	A
Buzzer	A	A				
LCD	A	A	A	A	A	A
Contrast	A	A	A	A	A	N/A
SD	N/A	N/A	N/A	N/A	A	A
SOUND	N/A	N/A	N/A	N/A	N/A	

A: Available N/A: Not available

Touch SW

This runs an operation check of the touch switches.

DIP SW

This runs an operation check of the DIP switches.

Back Light

The backlight color changes at 1-second intervals.

For 3-color LED (green, red, orange) backlight	Changes in the order of green, red and orange
For white LED backlight	Changes in the order of lighted, lighted out and lighted (weak).
For 3-color LED (white, red, pink) backlight	Changes in the order of white, red and pink.

Buzzer

This runs an operation check of the buzzer.

LCD

This displays a pattern and runs an operation check of the display.

Contrast

Touch the [+] and [-] keys to check changes in the contrast.

SD

This runs an operation check of reading a SD memory card.

Sound

The test sound is played. (Check it with a speaker.)

Touch panel operation:

[RETURN] To complete the settings and return to the previous screen, touch the [ESC] key or the [Initial setting] tab at the top of the screen.

Explanation of this function:

Test mode (self-diagnosis) screen

On the test mode screen of the GT01 and Gt11, the item name of the item that was just tested is highlighted.

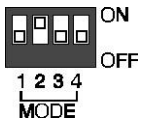
On the test mode screen of the GT21, GT30, GT32 and GT05, a check mark [✓] is displayed to the left of the key switch for items on the Test Menu which have already been tested.

(They are cleared when the screen is returned to the initial screen of the system menu.)

5.3.10 Inhibiting the System Menu Display

In order to prevent unauthorized persons from being able to change GT configuration settings, the GT is set up so that DIP switches can be used to make it impossible to display the system menu.

Operation mode setting switches



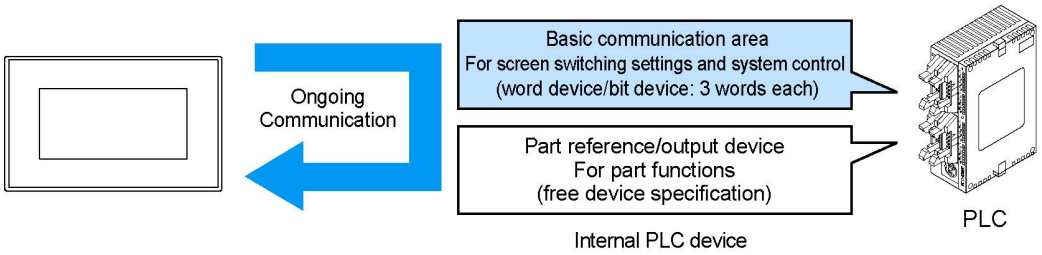
If the second operation mode setting switch is turned on, as shown at the left, access to the system menu is denied.

Switch No.	Function	OFF	ON
1	Usage inhibited	Should always be in the “OFF” position when unit is used.	
2	Inhibits system menu shift	Shift possible	Shift inhibited
3	Usage inhibited	Should always be in the “OFF” position when unit is used.	
4			

5.4 Setting the Basic Communication Area Between the GT and PLC

5.4.1 What is the Basic Communication Area?

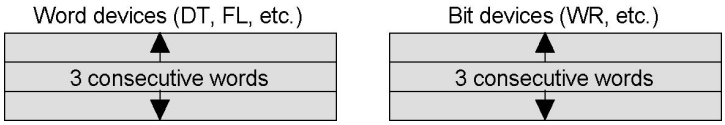
Communication between the GT and PLC is carried out as shown below.



As shown in the illustration, communication is carried out on an ongoing basis between the GT and internal devices in the PLC. Internal PLC devices are divided into the following two devices:

Basic communication area
This area is for system control, such as screen switching settings. PLC devices belong to this area on a fixed basis, and communication is constantly being carried out.

Breakdown of the basic communication area



- **Word device:** For reading devices handled in word units (3 consecutive words)
- **Bit device:** For reading devices handled in bit units (3 consecutive words)

References and output devices for parts
These are devices that are used in parts functions, and can be freely specified by the user. Communication is carried out on an ongoing basis only for those that are currently displayed on the screen and pertain to devices currently in use.

With the GT, before GTWIN screen creation tool is used to specify the devices for parts functions, the “basic communication area” must be determined.
DT0 to DT2 and WR0 to WR2 are set as the default values for the basic communication area, but the initial address can be changed using the following procedure.

Note:
The basic communication area should be used in the PLC ladder program to control the GT.

Reference: <5.2.1 Configuration Settings in “GTWIN”>

5.4.2 GT01 Basic Communication Area Map

In order for communication to be carried out between the GT01 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT through the PLC ladder program actually being run.
The starting address “N” of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT01 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT01 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT01 is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT01 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2																Data Input in Progress flag

Explanation of system area

BZ: This turns on the buzzer.

Forced-display flag: At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag: When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing: 0: Lighted (normal), 1: Flashing

Backlight Color: GT01: 3-color LED backlight 00: Off, 01: Green, 10: Red, 11: Orange
: 1-color LED backlight 00: Off, 01: Lighted, 10: Off, 11: Lighted (weak)
GT01R: 3-color LED backlight 00: Off, 01: White, 10: Red, 11: Pink

Data Input In Progress flag: This is 1 while data is being input, and 0 when data input has been completed. (only when using the keyboard)

5.4.3 GT05 Basic Communication Area Map

In order for communication to be carried out between the GT05 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT main unit through the PLC ladder program actually being run.
The starting address “N” of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT main unit.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT05 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT05 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT05 is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT05 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2														BAT LOW flag	BAT	Data Input in Progress flag

Explanation of system area

BZ: This turns on the buzzer.

Forced-display flag: At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag: When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing: 0: Lighted (normal), 1: Flashing

Backlight Color: GT05M: 3-color LED backlight 00: Off, 01: White, 10: Red, 11: Pink
GT05G: 3-color LED backlight 00: Off, 01: Green, 10: Red, 11: Orange
GT05S: 1-color LED backlight 00: Off, 01: Lighted, 10: Off, 11: Lighted

Data Input In Progress flag: This is 1 while data is being input, and 0 when data input has been completed. (only when using the keyboard)

BAT: This goes on if clock data and Hold PLC Device data held in the SRAM are not being backed up normally. (This bit also goes on if the SRAM is not backed up by the internal secondary battery. The “ ” mark is displayed at the bottom right of the screen. *1)

BAT LOW flag: This goes on when the battery is running low. Please replace the battery with a new one within a week after this bit went on. (The “ ” mark is displayed at the bottom right of the screen. *1)

*1 When the battery error display is set to Off, the “ ” mark will not be displayed.
*2 The BAT and BAT LOW flags activate in the both cases that the battery error display is set to “On” and “Off”.

5.4.4 GT11 Basic Communication Area Map

In order for communication to be carried out between the GT11 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT through the PLC ladder program actually being run.
The starting address "N" of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT11 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT11 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT11is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT11 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2														BAT LOW flag	BAT	Data Input in Progress flag

Explanation of system area

BZ:	This turns on the buzzer.
Forced-display flag:	At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)
Backlight Valid flag:	When the bit is turned on, the backlight flashing/backlight color control becomes effective.
Backlight Flashing:	0: Lighted (normal), 1: Flashing
Backlight Color:	3-color LED backlight 00: Off, 01: Green, 10: Red, 11: Orange 1-color LED backlight 00: Off, 01: Lighted, 10: Off, 11: Lighted (weak)
Data Input In Progress flag:	This is 1 while data is being input, and 0 when data input has been completed. (only when using the keyboard)
BAT:	This goes on if clock data and Hold PLC Device data held in the SRAM are not being backed up normally. (This bit also goes on if the SRAM is not backed up by the internal secondary battery. The "" mark is displayed at the bottom right of the screen. *1)
BAT LOW flag:	This goes on when the battery is running low. Please replace the battery with a new one within a week after this bit went on. (The "" mark is displayed at the bottom right of the screen. *1)

*1 When the battery error display is set to Off, the "" mark will not be displayed.

*2 The BAT and BAT LOW flags activate in the both cases that the battery error display is set to "On" and "Off".

5.4.5 GT21 Basic Communication Area Map

In order for communication to be carried out between the GT21 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT through the PLC ladder program actually being run.
The starting address “N” of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT21 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT21 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT21 is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT21 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2														BAT LOW flag	BAT	Data Input in Progress flag

Explanation of system area

BZ: This turns on the buzzer.

Forced-display flag: At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag: When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing: 0: Lighted (normal), 1: Flashing

Backlight Color: 00: Off, 01: Lighted, 10: Lighted, 11: Lighted

Data Input In Progress flag: This is 1 while data is being input, and 0 whendata input has been completed. (only when using the keyboard)

BAT: This goes on if clock data and Hold PLC Device data held in the SRAM are not being backed up normally. (This bit also goes on if the SRAM is not backed up by the internal secondary battery. The “” mark is displayed at the bottom right of the screen. *1)

BAT LOW flag: This goes on when the battery is running low. Please replace the battery with a new one within a week after this bit went on. (The “” mark is displayed at the bottom right of the screen. *1)

*1 When the battery error display is set to Off, the “” mark will not be displayed.

*2 The BAT and BAT LOW flags activate in the both cases that the battery error display is set to “On” and “Off”.

5.4.6 GT30 Basic Communication Area Map

In order for communication to be carried out between the GT30 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT through the PLC ladder program actually being run.
The starting address "N" of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT30 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT30 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT30 is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT30 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2														BAT LOW flag	BAT	Data Input in Progress flag

Explanation of system area

BZ: This turns on the buzzer.

Forced-display flag: At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag: When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing: 0: Lighted (normal), 1: Flashing

Backlight Color: 00: Off, 01: Lighted, 10: Lighted, 11: Lighted

Data Input In Progress flag: This is 1 while data is being input, and 0 whendata input has been completed. (only when using the keyboard)

BAT: This goes on if clock data and Hold PLC Device data held in the SRAM are not being backed up normally. (This bit also goes on if the SRAM is not backed up by the internal secondary battery. The "⚡" mark is displayed at the bottom right of the screen. *1)

BAT LOW flag: This goes on when the battery is running low. Please replace the battery with a new one within a week after this bit went on. (The "▮" mark is displayed at the bottom right of the screen. *1)

*1 When the battery error display is set to Off, the "⚡" mark will not be displayed.

*2 The BAT and BAT LOW flags activate in the both cases that the battery error display is set to "On" and "Off".

5.4.7 GT32 Basic Communication Area Map

In order for communication to be carried out between the GT32 and PLC, an internal device area like that shown below is provided in the PLC. This should be used to control the GT through the PLC ladder program actually being run.
The starting address “N” of the field shown below is specified in the GT configuration settings of GTWIN screen creation tool, and is then sent to the GT.

Word devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	Screen No. specified by PLC (area read by GT32 from PLC)															
N+1	Usage prohibited															
N+2	No. of currently displayed screen (area in which data is written from GT32 to PLC)															

Explanation of system area

Screen No. specified by PLC: The screen number specified on the GT32 is specified from the PLC in hexadecimal format.

No. of currently displayed screen: The number of the screen currently displayed on the GT32 is written to the PLC in hexadecimal format.

Bit devices

Word position	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
N+0	BZ	Forced display flag	Back-light valid flag	Back-light Flashing	Back-light Color											
N+1	Usage prohibited															
N+2														BAT LOW flag	BAT	Data Input in Progress flag

Explanation of system area

BZ: This turns on the buzzer.

Forced-display flag: At the rise when the bit is turned on, the screen specifed by the PLC is forcibly displayed. (This is executed only when at the rise of the bit.)

Backlight Valid flag: When the bit is turned on, the backlight flashing/backlight color control becomes effective.

Backlight Flashing: 0: Lighted (normal), 1: Flashing

Backlight Color: 00: Off, 01: Lighted, 10: Lighted, 11: Lighted

Data Input In Progress flag: This is 1 while data is being input, and 0 whendata input has been completed. (only when using the keyboard)

BAT: This goes on if clock data and Hold PLC Device data held in the SRAM are not being backed up normally. (This bit also goes on if the SRAM is not backed up by the internal secondary battery. The “” mark is displayed at the bottom right of the screen. *1)

BAT LOW flag: This goes on when the battery is running low. Please replace the battery with a new one within a week after this bit went on. (The “” mark is displayed at the bottom right of the screen. *1)

*1 When the battery error display is set to Off, the “” mark will not be displayed.

*2 The BAT and BAT LOW flags activate in the both cases that the battery error display is set to “On” and “Off”.

5.4.8 Bit Device Functions in Basic Communication Area

In order for communication to be carried out between the GT and PLC, an internal device area like that shown below is provided in the PLC. This basic communication area contains two types of devices: word devices, which are used to handle screen numbers and other data, and bit devices, which are used for bit information. The various bits of the bit devices are turned on and off from the PLC, and can be used to control various GT operations.

Changing the backlight color
For GT01, GT11, GT05M and GT05G
Bits A and B of the first word of the bit device are used to change the backlight color. The color of the backlight can be changed by turning these bits on and off. To make these settings valid, howeve, Bit D (Backlight Valid flag) must always be turned on at the same time.

Bit status		Backlight color		
B	A	3-color LED backlight (Green, red, orange)	1-color LED backlight	3-color LED backlight (White, red, pink)
OFF	OFF	Off	Off	Off
OFF	ON	Green	Lighted	White
ON	OFF	Red	Off	Red
ON	ON	Orange	Lighted (weak)	Pink

For GT21, GT30, GT32T* and GT05S
The A and B bits of the initial bit device word are used to turn the backlight on and off. These bits can be changed to change the backlight illumination status. To make these settings valid, however, Bit D (Backlight Valid flag) must always be turned on at the same time.

Bit status		Backlight color
B	A	
OFF	OFF	Off
OFF	ON	Lighted
ON	OFF	
ON	ON	

Using a flashing backlight
Bit C of the first word of the bit device is used to make the backlight flash. The backlight status can be changed by turning this bit on and off. To make this setting valid, however, Bit D (Backlight Valid flag) must always be turned on at the same time.

Bit status	Backlight color
C	
OFF	Lighted
ON	Flashing

Making the buzzer sound
Bit F of the first word of the bit device is used to make the buzzer sound. The buzzer status can be changed by turning this bit on and off.

Bit status	Buzzer status
F	
OFF	Stopped
ON	Buzzer output

Data Input in Progress flag
With the GT, while data is being input from the screen keyboard part, Bit 0 of the third word of the bit device is on.
Applications should be set up so that, when this bit is on, the screen cannot be chagned from the PLC.

Reference: <5.4.2 GT01 Basic Communication Area Map>
<5.4.3 GT05 Basic Communication Area Map>
<5.4.4 GT11 Basic Communication Area Map>
<5.4.5 GT21 Basic Communication Area Map>
<5.4.6 GT30 Basic Communication Area Map>
<5.4.7 GT32 Basic Communication Area Map>

Chapter 6

Troubleshooting

6.1 What to DO If Something Unusual Occurs (GT01, GT11 and GT21)

Problem	Cause	Solution
Screen is blank	1) Power is not on.	1) Supply the power supply to unit as per specifications.
	2) (When only lamp and message parts are configured to the base screen) Value of substitute reference device value does not exist in substitute data.	2) Check the address of the substitute reference device and the device values on the PLC side.
Error code [ER**] appears at the top right of the screen	An error has occurred in communication between the GT and an external device (e.g. PLC).	Refer to <8.4 Troubleshooting Error Codes>.
Screen displays [No Screen data]	There is no base screen data in the GT. (Appears even when GT configuration data exists.)	Transfer base screen data from GTWIN.
Screen displays [Screen No. Error]	1) Screen settings from the PLC, the GT's switch part or the auto-paging indicate an unregistered screen number.	1) Create and register screen content or specify the correct screen number.
	2) When bringing up the keyboard screen during data input, an unregistered keyboard screen number was specified.	2) Create and register keyboard screen or specify the correct keyboard number.
	3) GT configuration data and keyboard screen data exist in the GT, but there is no base screen data.	3) Transfer base screen data from GTWIN.
Screen displays [Memory is Full]	The total capacity of transferred base screen data exceeds the 384 kbyte capacity of the GT. For GT01, the max. capacity is 384 kbytes. For GT11, the max. capacity is 1408 kbytes. For GT21, the max. capacity is 6656 kbytes.	Delete part of the base screen data so that the capacity doesn't exceed the total capacity. Data capacity can be checked by going to [View (V)]→[Memory Usage Conditions] on GTWIN menu bar. When the data capacity is not over the limit, invalid data could possibly be remaining in the GT. When transferring data, do so after deleting the screen.
An unspecified screen appeared/there is trouble when switching screens.	1) The screen specification in the PLC screen setting, the GT switch part or the auto-paging is wrong.	1) Specify the correct screen number.
	2) The startup screen is specified in the GT configuration settings (GTWIN).	2) Check the start-up screen setting for the GT configuration settings in GTWIN. Delete unnecessary settings and re-transfer configuration data.
	3) An erroneous device or value is specified in the first word of the basic communication area word device.	3) Check the device content specified on the PLC side in the first word of the basic communication area. (Do not use the basic communication area with ladder programs.)

Problem	Cause	Solution
Screen doesn't switch	1) No screen number has been written to the screen setting area (the first word in the basic communication area word device) from the PLC.	1) Specify correct screen number.
	2) The screen number to which you are attempting to switch has already been written from the PLC to the screen setting area (the first word in the basic communication area word device.)	2) Refer to [If the screen does not change as expected] in ARCT1F357 GTWIN Operational Guide Book. (Do not use the basic communication area with ladder programs.)
Screen is dim	1) The power voltage may be low.	1) Check the capacity of the power supply unit if it is enough for the GT's power consumption.
	2) The contrast is set too low.	2) Bring up the system menu and adjust the contrast.
	3) The backlight brightness is set too dark.	3) Bring up the system menu and adjust the brightness.
	4) The backlight is off due to the [Backlight Auto-off] setting in the [Setup] of the GT configuration settings in GTWIN.	4) Touching any area of the screen lights that area. If a switch part is set on the touched area, the area will not light even if touched. To change the setting, change the content of the backlight auto-off settings.
Backlight goes off too quickly	1)The backlight auto-off timer setting is too short.	1) Change the backlight auto-off timer setting.
Date/time display is incorrect	1) The PLC's internal calendar timer used as a reference is incorrect.	1) Adjust by rewriting the value in the PLC's internal calendar timer.
Touch panel doesn't work	1) Valid conditions have been set for the switch par, but those conditions have not been met.	1) Check that the device status conditions on the PLC side are valid.
No operating sounds are heard when the touch panel is pressed.	1) The [Switch Sounds] setting under [Options] in the switch part attributes is set to [Disabled].	1) Change the setting to [Enabled].
	2)The [Touch Sounds] setting under [Setup] in the GT configuration settings in GTWIN is set to [Disabled].	2) Change the setting to [Enabled].
Nothing happens for about 10 seconds after turning on power.	Communication conditions of GT (COM port) and PLC differ.	Verify communication settings of GT and PLC and then make them the same.

Problem	Cause	Solution
Buzzer sounds continuously	Bit F of the first word in the basic communication area bit device is set to ON.	Set the F bit to OFF on the PLC side. (Do not use the basic communication area with ladder programs.)
Backlight color changes/ flashes	Bits A and B, and Bit D, of the first word (backlight color setting) in the basic communication area bit device are set to ON. Or, Bits C and D (backlight flashing setting) are set to ON.	Perform correct bit operations on the PLC side. (Do not use the basic communication area with ladder programs.)
Cannot transfer data from GTWIN	1) The screen transfer cable is not connected.	1) Confirm that the screen transfer cable is correctly and firmly connected.
	2) The PC and GT COM port are connected.	2) Connect to TOOL port with screen transfer cable.
	3) The TOOL port of the GT has been set to 230400 bps.	3) Set the baud rate for the GTWIN communication condition to 230400 bps before transfer data.
	4) The network type in the communication settings has been set to either “Ethernet” or “USB”.	4) Set the network type in the communication settings to “RS232C”.
- Screen is blank (power supply and substitution settings noted above do not apply) - An incorrect screen is displayed (error codes and erroneous date and time items noted above do not apply) - Switch doesn’t work (grid and validity settings noted above are correct) - Buzzer sounds continuously	An error has occurred in the GT system.	1) After confirming the safety of the device, etc., turn off the power supply and then turn it on again. The GT CPU will be reset. ⇩ 2) If 1) produces no change, bring up the system menu and initialize the memory (F-ROM), then transfer data again from GTWIN to the GT. NOTE: When doing this, all base screen data, GT setting data, keyboard screen data, and bitmap data will be lose. Before doing this, make sure all data has been backed up. ⇩ 3) If 2) produces no change, set the operating mode setting switches 2, 3 and 4 on the rear of the main unit to ON and reset the power supply. NOTE: When doing this, all of the contents will revert to those in effect at the time of shipping, and all of the GT memory contents will be cleared. Before doing this, make sure all data has been backed up.

6.2 What to DO If Something Unusual Occurs (GT30)

Problem	Cause	Solution
Screen is blank	1) Power is not on.	1) Supply the power supply to unit as per specifications.
	2) (When only lamp and message parts are configured to the base screen) Value of substitute reference device value does not exist in substitute data.	2) Check the address of the substitute reference device and the device values on the PLC side.
Error code [ER**] appears at the top right of the screen	An error has occurred in communication between the GT and an external device (e.g. PLC).	Refer to <8.4 Troubleshooting Error Codes>.
Screen displays [No Screen data]	There is no base screen data in the GT. (Appears even when GT configuration data exists.)	Transfer base screen data from GTWIN.
Screen displays [Screen No. Error]	1) Screen settings from the PLC, the GT30 switch part or the auto-paging indicate an unregistered screen number.	1) Create and register screen content or specify the correct screen number.
	2) When bringing up the keyboard screen during data input, an unregistered keyboard screen number was specified.	2) Create and register keyboard screen or specify the correct keyboard number.
	3) GT configuration data and keyboard screen data exist in the GT, but there is no base screen data.	3) Transfer base screen data from GTWIN.
Screen displays [Memory is Full]	The total capacity of transferred base screen data exceeds capacity of the GT. For GT30M, the max. capacity is 1.5 Mbytes. For GT30C, the max. capacity is 3.25 Mbytes.	Delete part of the base screen data so that the total capacity doesn't exceed the capacity of GT. Data capacity can be checked by going to [View (V)]→[Memory Usage Conditions] on GTWIN menu bar.
An unspecified screen appeared/there is trouble when switching screens.	1) The screen specification in the PLC screen setting, the GT switch part or the auto-paging is wrong.	1) Specify the correct screen number.
	2) The startup screen is specified in the GT configuration settings (GTWIN).	2) Check the start-up screen setting for the GT configuration settings in GTWIN. Delete unnecessary settings and re-transfer configuration data.
	3) An erroneous device or value is specified in the first word of the basic communication area word device.	3) Check the device content specified on the PLC side in the first word of the basic communication area. (Do not use the basic communication area with ladder programs.)

Problem	Cause	Solution
Screen doesn't switch	1) No screen number has been written to the screen setting area (the first word in the basic communication area word device) from the PLC.	1) Specify correct screen number.
	2) The screen number to which you are attempting to switch has already been written from the PLC to the screen setting area (the first word in the basic communication area word device.)	2) Refer to [If the screen does not change as expected] in ARCT1F357 GTWIN Operational Guide Book. (Do not use the basic communication area with ladder programs.)
Screen is dim	1) The power voltage may be low.	1) Supply the power supply to unit as per specifications.
	2) the contrast is set too low.	2) Bring up the system menu and adjust the contrast.
	3) The backlight is off due to the [Backlight Auto-off] setting in the [Setup] of the GT configuration settings in GTWIN.	3) Touching any area of the screen lights that area. If a switch part is set on the touched area, the area will not light even if touched. To change the setting, change the content of the backlight auto-off settings.
Backlight goes off too quickly	1)The backlight auto-off timer setting is too short.	1) Change the backlight auto-off timer setting.
Date/time display is incorrect	1) The GT internal clock is incorrect.	1) Bring up the system menu and adjust the clock.
	2) No battery has been inserted.	2) Open the cover on the option compartment and install a battery.
	3) The battery insulation sheet has not been removed.	3) Open the cover on the option compartment and remove the battery insulation sheet.
	4) The battery has run down.	4) Replace the battery.
	5) The PLC's internal calendar timer used as a reference is incorrect.	5) Adjust by rewriting the value in the PLC's internal calendar timer.
Hold PLC Device data content isn't saved	1) No battery has been inserted.	1) Open the cover on the option compartment and install a battery.
	2) The battery insulation sheet has not been removed.	2) Open the cover on the option compartment and remove the battery insulation shett.
	3) The battery has run down.	3) Replace the battery.
Touch panel doesn't work	1) The switch part size setting does not match the touch panel grid.	1) When creating screens with GTWIN, match grid settings to touch panel and make them valid, then resize.
	2) Valid conditions have been set for the switch par, but those conditions have not been met.	2) Check that the device status conditions on the PLC side are valid.
No operating sounds are heard when the touch panel is pressed.	1) The [Switch Sounds] setting under [Options] in the switch part attributes is set to [Disabled].	1) Change the setting to [Enabled].
	2) The [Touch Sounds] setting under [Setup] in the GT configuration settings in GTWIN is set to [Disabled].	2) Change the setting to [Enabled].

Problem	Cause	Solution
Buzzer sounds continuously	Bit F of the first word in the basic communication area bit device is set to ON.	Set the F bit to OFF on the PLC side. (Do not use the basic communication area with ladder programs.)
Backlight color flashes	Bits C and D, of the first word (backlight flashing setting) in the basic communication area bit device are set to ON.	Perform correct bit operations on the PLC side. (Do not use the basic communication area with ladder programs.)
Cannot transfer data from GTWIN	1) The screen transfer cable is not connected.	1) Confirm that the screen transfer cable is correctly and firmly connected.
	2) The PC and GTCOM port are connected.	2) Connect to TOOL port with screen transfer cable.
	3) The network type in the communication settings has been set to either “Ethernet” or “USB”.	3) Set the network type in the communication settings to “RS232C”.
- Screen is blank (power supply and substitution settings noted above do not apply) - An incorrect screen is displayed (error codes and erroneous date and time items noted above do not apply) - Switch doesn’t work (grid and validity settings noted above are correct) - Buzzer sounds continuously	An error has occurred in the GT system.	1) After confirming the safety of the device, etc., turn off the power supply and then turn it on again. The GT CPU will be reset. ⇩ 2) If 1) produces no change, bring up the system menu and initialize the memory (F-ROM), then transfer data again from GTWIN to the GT. NOTE: When doing this, all base screen data, GT setting data, keyboard screen data, and bitmap data will be lose. Before doing this, make sure all data has been backed up. ⇩ 3) If 2) produces no change, set the operating mode setting switches 2, 3 and 4 on the GT to ON and reset the power supply. NOTE: When doing this, all of the contents will revert to those in effect at the time of shipping, and all of the GT memory contents will be cleared. Before doing this, make sure all data has been backed up.
Nothing happens for about 10 seconds after turning on power.	Communication conditions of GT (COM port) and PLC differ.	Verify communication settings of GT and PLC and then make them the same.

6.3 What to DO If Something Unusual Occurs (GT05 and GT32)

Problem	Cause	Solution
Screen is blank	1) Power is not on.	1) Supply the power supply to unit as per specifications.
	2) (When only lamp and message parts are configured to the base screen) Value of substitute reference device value does not exist in substitute data.	2) Check the address of the substitute reference device and the device values on the PLC side.
Error code [ER****] appears at the top right of the screen	An error has occurred in communication between the GT and an external device (e.g. PLC).	Refer to <8.4 Troubleshooting Error Codes>.
Screen displays [No Screen data]	There is no base screen data in the GT. (Appears even when GT configuration data exists.)	Transfer base screen data from GTWIN.
Screen displays [Screen No. Error]	1) Screen settings from the PLC, the GT's switch part or the auto-paging indicate an unregistered screen number.	1) Create and register screen content or specify the correct screen number.
	2) When bringing up the keyboard screen during data input, an unregistered keyboard screen number was specified.	2) Create and register keyboard screen or specify the correct keyboard number.
	3) GT configuration data and keyboard screen data exist in the GT, but there is no base screen data.	3) Transfer base screen data from GTWIN.
Screen displays [Memory is Full]	The total capacity of transferred base screen data exceeds the memory capacity of the GT. For GT05M, GT05G and GT32M, the max. capacity is 2048 kbytes. For GT05S and GT32T*, the max. capacity is 12288 kbytes.	Delete part of the base screen data so that the capacity doesn't exceed the total capacity. Data capacity can be checked by going to [View (V)]→[Memory Usage Conditions] on GTWIN menu bar. When the data capacity is not over the limit, invalid data could possibly be remaining in the GT. When transferring data, do so after deleting the screen.
An unspecified screen appeared/there is trouble when switching screens.	1) The screen specification in the PLC screen setting, the GT switch part or the auto-paging is wrong.	1) Specify the correct screen number.
	2) The startup screen is specified in the GT configuration settings (GTWIN).	2) Check the start-up screen setting for the GT configuration settings in GTWIN. Delete unnecessary settings and re-transfer configuration data.
	3) An erroneous device or value is specified in the first word of the basic communication area word device.	3) Check the device content specified on the PLC side in the first word of the basic communication area. (Do not use the basic communication area with ladder programs.)
Screen doesn't switch	1) No screen number has been written to the screen setting area (the first word in the basic communication area word device) from the PLC.	1) Specify correct screen number.
	2) The screen number to which you are attempting to switch has already been written from the PLC to the screen setting area (the first word in the basic communication area word device.)	2) Refer to [If the screen does not change as expected] in ARCT1F357 GTWIN Operational Guide Book. (Do not use the basic communication area with ladder programs.)

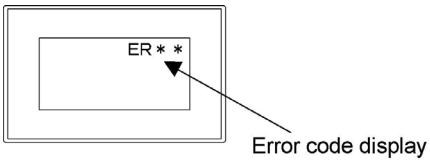
Problem	Cause	Solution
Screen is dim	1) The power voltage may be low.	1) Check the capacity of the power supply unit if it is enough for the GT's power consumption.
	2) The contrast is set too low.	2) Bring up the system menu and adjust the contrast.
	3) The backlight is off due to the [Backlight Auto-off] setting in the [Setup] of the GT configuration settings in GTWIN.	3) Touching any area of the screen lights that area. If a switch part is set on the touched area, the area will not light even if touched. To change the setting, change the content of the backlight auto-off settings.
Backlight goes off too quickly	1)The backlight auto-off timer setting is too short.	1) Change the backlight auto-off timer setting.
Date/time display is incorrect (when using the GT's internal clock)	1) The GT's internal clock used as a reference is incorrect.	1) Adjust the clock from the system menu.
	2) No battery has been inserted.	2) Purchase a battery and install it.
	3) The battery has run down.	3) Replace the battery.
Date/time display is incorrect (when using the PLC's internal calender timer)	1) The PLC's internal calendar timer used as a reference is incorrect.	1) Adjust by rewriting the value in the PLC's internal calendar timer.
Hold PLC Device data content isn't saved	1) No battery has been inserted.	1) Purchase a battery and install it.
	2) The battery has run down.	2) Replace the battery.
Date/time display is incorrect	1) The PLC's internal calendar timer used as a reference is incorrect.	1) Adjust by rewriting the value in the PLC's internal calendar timer.
Touch panel doesn't work	1) Valid conditions have been set for the switch par, but those conditions have not been met.	1) Check that the device status conditions on the PLC side are valid.
No operating sounds are heard when the touch panel is pressed.	1) The [Switch Sounds] setting under [Options] in the switch part attributes is set to [Disabled].	1) Change the setting to [Enabled].
	2)The [Touch Sounds] setting under [Setup] in the GT configuration settings in GTWIN is set to [Disabled].	2) Change the setting to [Enabled].
Nothing happens for about 10 seconds after turning on power.	Communication conditions of GT (COM port) and PLC differ.	Verify communication settings of GT and PLC and then make them the same.

Problem	Cause	Solution
Buzzer sounds continuously	Bit F of the first word in the basic communication area bit device is set to ON.	Set the F bit to OFF on the PLC side. (Do not use the basic communication area with ladder programs.)
Backlight color changes/ flashes	Bits A and B, and Bit D, of the first word (backlight color setting) in the basic communication area bit device are set to ON. Or, Bits C and D (backlight flashing setting) are set to ON.	Perform correct bit operations on the PLC side. (Do not use the basic communication area with ladder programs.)
Cannot transfer data from GTWIN	1) The USB or LAN cable (GT32T1) is not connected.	1) Confirm that the screen transfer cable is correctly and firmly connected.
	2) The PC and GT COM. port are connected.	2) Connect the USB cable or LAN cable (GT32T1) correctly.
	3) The network type in the communication settings has been set to “RS232C”.	3) Set the network type in the communication settings to “Ethernet” for using a LAN cable. Set the network type to “USB” for using a USB cable.
- Screen is blank (power supply and substitution settings noted above do not apply) - An incorrect screen is displayed (error codes and erroneous date and time items noted above do not apply) - Switch doesn’t work (grid and validity settings noted above are correct) - Buzzer sounds continuously	An error has occurred in the GT system.	1) After confirming the safety of the device, etc., turn off the power supply and then turn it on again. The GT CPU will be reset. ⇩ 2) If 1) produces no change, bring up the system menu and initialize the memory (F-ROM), then transfer data again from GTWIN to the GT. NOTE: When doing this, all base screen data, GT setting data, keyboard screen data, and bitmap data will be lose. Before doing this, make sure all data has been backed up. ⇩ 3) If 2) produces no change, set the operating mode setting switches 2, 3 and 4 on the rear of the main unit to ON and reset the power supply. NOTE: When doing this, all of the contents will revert to those in effect at the time of shipping, and all of the GT memory contents will be cleared. Before doing this, make sure all data has been backed up.
No sound is output.	1) The speaker is not connected.	1) Connect an audio output equipment (speaker with a built-in ϕ3.5-mini plug amplifier).
	2) The setting for using sound is not on.	2) Set the sound setting of the GTWIN configuration settings to be on.

6.4 Error Codes and How to Handle Them

6.4.1 About Error Codes

When an error occurs in the GT series, an error code displays at the top right of the screen. There are two types of error codes, GT series error codes and PLC error codes.



6.4.2 GT Series Error Codes

The following error codes are displayed when there is an error in the GT.

For GT01, GT11, GT21 and GT30

Code No.	Content	Cause and solution
GTFF	Time up error No response from the PLC.	1) The PLC connection cable is disconnected. Check the connection cable to make sure it is connected. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT.
GT21	Data error A data error occurred during communication.	1) An error exists in the communication condition settings. Check the PLC and GT baud rate and transfer format. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT.
GT22	Overrun error The GT cannot receive data.	The reception buffer in the GT is overflowing. There could be an error in the PLC Re-supply power to the PLC and GT.

For GT05 and GT32

Code No.	Content	Cause and solution
**00FF	Time up error	1) The PLC connection cable is disconnected. Check the connection cable to make sure it is connected. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT.
**0100	Keyboard screen data parts digit error	Check if the digit of the data parts on the keyboard screen has been set correctly.
**0101	Alarm history error	When updating the alarm history display is stopped, alarm history data displayed on the GT's screen has been updated within the memory. Once the stop of display update is canceled, new data is displayed.
**0500	Tool setting error	A device that does not exist in the selected PLC model is specified. Check the device that the data screen setting has been made.
**1000	SD memory card not inserted	The SD memory card is not inserted to the SD memory card slot properly. Check the SD memory card slot.
**1001	SD memory card writing error	Data cannot be written to the SD memory card. Check whether the SD memory card is not write-protected.
**1002	SD memory card memory full	Data cannot be written as the memory of the SD memory card has been exhausted. Delete some data in the SD memory card or prepare a new SD memory card.
**1003	SD memory card reading error	The data in the SD memory card cannot be read. Check whether the saved data in the SD memory card is not damaged with a PC.
**1005	SD memory card saved file name error	The file name to be saved to the SD memory card from the GT is not specified properly. Specify the file name properly.
**1100	Ethernet IP address setting error	The IP address for Ethernet is not specified correctly. Check the IP address for the GT.
**1101	Ethernet subnet mask setting error	The subnet mask for Ethernet is not specified correctly. Check the subnet mask for the GT.
**1102	Ethernet default gateway setting error	The default gateway for Ethernet is not specified correctly. Check the default gateway for the GT.
**1103	Ethernet port No. setting error	The port No. for Ethernet is not specified correctly. Check the port No. error for the GT.
**F000	User's memory error	The memory for saving screen data may be damaged. Please contact us.

6.4.3 When Connected to a FP Series PLC

Error codes which are sent from the PLC are listed in the table below. For details, refer to the table of MEWTOCOL-COM communication errors in PLC user's manuals.

For GT01, GT11, GT21 and GT30

Code No.	Content	Cause and solution
ER21	Data error A data error occurred during communication.	1) There is an error in the communication condition settings. Check the PLC and GT baud rate and transfer format. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT.
ER22	Overrun error The PLC isn't receiving data.	The CPU unit's reception buffer is overflowing. There could be an error in the PLC. Re-supply power to the PLC and GT.
ER40	BCC error A data error occurred during communication.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER41	Format error The PLC has been sent a command that doesn't match the protocol.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER42	NOT support error The GT has sent a non-supported command to the PLC.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER53	BUSY error The PLC is currently processing another command.	A large amount of data is being communicated with another RS232C port on the PLC. Wait until the error is gone.
ER60	Parameter errror	The specified parameter does not exist, or it cannot be used.
ER61	Data run error There is an error in the register or relay number.	A register or relay number which doesn't exist in the PLC was specified during screen creation using GTWIN. Correct the output device being used with the part, or the transfer of clock data to an external device.

For GT05 and GT32

Code No.	Content	Cause and solution
ER0021	Data error A data error occurred during communication.	1) There is an error in the communication condition settings. Check the PLC and GT baud rate and transfer format. 2) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT.
ER0022	Overrun error The PLC isn't receiving data.	The CPU unit's reception buffer is overflowing. There could be an error in the PLC. Re-supply power to the PLC and GT.
ER0040	BCC error A data error occurred during communication.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER0041	Format error The PLC has been sent a command that doesn't match the protocol.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER0042	NOT support error The GT has sent a non-supported command to the PLC.	1) There is a temporary error due to noise, etc. Re-supply power to the PLC and GT. 2) There is an error in the CPU unit. Re-supply power to the PLC and GT.
ER0053	BUSY error The PLC is currently processing another command.	A large amount of data is being communicated with another RS232C port on the PLC. Wait until the error is gone.
ER0060	Parameter errror	The specified parameter does not exist, or it cannot be used.
ER0061	Data run error There is an error in the register or relay number.	A register or relay number which doesn't exist in the PLC was specified during screen creation using GTWIN. Correct the output device being used with the part, or the transfer of clock data to an external device.

6.4.4 When Connected to a PLC (FX Series) Made by Mitsubishi Electric Corporation

For GT01, GT11, GT21 and GT30

Code No.	Content	Cause and solution
ERFF	Time up error There is no response from the PLC.	1) PLC connection cable is disconnected. Check the wiring of the connection cable and check for disconnection. 2) It is a temporary error caused by noise, etc. Turn on the power supplies for PLC or GT again.
ER10	Data error A data error occurred during communication	Check for errors in the communication conditions settings.
ER12	Overrun error The GT cannot receive data.	PLC runaway might be the problem.
ER61	PLC error A NAK error has been returned from the PLC.	Verify the PLC settings.

For GT05 and GT32

Code No.	Content	Cause and solution
ERFFFE	NAK error A NAK error has been returned from the PLC.	Verify the PLC settings.

6.4.5 When Connected to a PLC Made by Omron Corporation

For GT01, GT11, GT21 and GT30

Code No.	Content	Cause and solution
ER00	Time up error There is no response from the PLC.	1) PLC connection cable is disconnected. Check the wiring of the connection cable and check for disconnection. 2) It is a temporary error caused by noise, etc. Turn on the power supplies for PLC or GT again.
ER01	Cannot be executed due to operation mode. (The PLC received the command that cannot be executed in the operation mode.)	Change the mode of the PLC from the operation mode to the monitor mode.
ER10	Data error A data error occurred during communication	Check for errors in the communication conditions settings.
ER12	Overrun error The GT cannot receive data.	PLC runaway might be the problem.
ER15	Numerical data error Designated read/write area is wrong.	Verify whether or not the reference device used with the basic communication area and each part is a readable and writable area.

- Error codes other than these are based on Omron PLC error codes.
- Be sure to used the PLC in monitor mode. Otherwise, communication will not work properly.

For GT05 and GT32

Code No.	Content	Cause and solution
ER0001	Cannot be executed due to operation mode. (The PLC received the command that cannot be executed in the operation mode.)	Change the mode of the PLC from the operation mode to the monitor mode.
ER0010	Data error A data error occurred during communication	Check for errors in the communication conditions settings.
ER0012	Overrun error The GT cannot receive data.	PLC runaway might be the problem.
ER0015	Numerical data error Designated read/write area is wrong.	Verify whether or not the reference device used with the basic communication area and each part is a readable and writable area.

- Error codes other than these are based on Omron PLC error codes.
- Be sure to used the PLC in monitor mode. Otherwise, communication will not work properly.

6.4.6 When Connected to Modbus

For GT01, GT11, GT21 and GT30

Code No.	Content	Cause and solution
ERFF	Time up error There is no response from the PLC.	1) PLC connection cable is disconnected. Check the wiring of the connection cable and check for disconnection. 2) It is a temporary error caused by noise, etc. Turn on the power supplies for PLC or GT again.
ERFE	Response error There is an abnormal response returned from the external device.	Check the data to be returned from the external device.

For GT05 and GT32

Code No.	Content	Cause and solution
**0001	Time up error There is no response from the PLC.	1) PLC connection cable is disconnected. Check the wiring of the connection cable and check for disconnection. 2) It is a temporary error caused by noise, etc. Turn on the power supplies for PLC or GT again.
**ERFE	Response error There is an abnormal response returned from the external device.	Check the data to be returned from the external device.

6.4.7 When Connected to a PLC Made by Toshiba Machine Co., Ltd.

For GT05 and GT32

Code No.	Content	Cause and solution
ERFFFE	Parameter errror	The specified parameter does not exist, or it cannot be used.

Chapter 7

Specifications

7.1 GT01

7.1.1 General Specifications

Item	GT01 specifications			
	AIGT0030B1 AIGT0030H1 AIGT0130B1 AIGT0130H1 AIGT0230B1 AIGT0230H1	AIGT0032B1 AIGT0032H1 AIGT0132B1 AIGT0132H1 AIGT0232B1 AIGT0232H1	AIGT0030B AIGT0030H AIGT0130B AIGT0130H AIGT0230B AIGT0230H	AIGT0032B AIGT0032H AIGT0132B AIGT0132H AIGT0232B AIGT0232H
Rated voltage	5 V DC		24 V DC	
Operating voltage range	4.5 to 5.5 V DC		21.6 to 26.4 V DC	
Power consumption	1W or less	1.1 W or less	2 W or less	
Ambient temperature	0 to +50 °C			
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)			
Storage temperature	-20 to +60 °C			
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)			
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes			
Shock resistance	98 m/s^2, 4 times on 3 axes			
Noise immunity	1000 V [P-P] or more, Pulse width 50 ns, 1μs between power supply terminals (based on in-house measurements) *When using our exclusive cable			
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.			
Weight	Approx. 160 g			

Note) If using cables other than the cables manufactured by us, use shielded cables, and attach ferrite cores for the noiseproof measures if necessary.

7.1.2 Display

Item	GT01 specifications		
	AIGT0030B1/ AIGT0030H1 AIGT0030B/AIGT0030H AIGT0032B1/ AIGT0032H1 AIGT0032B/AIGT0032H	AIGT0130B1/ AIGT0130H1/ AIGT0130B/ AIGT0130H AIGT0132B1/ AIGT0132H1 AIGT0132B/AIGT0132H	AIGT0230B1/ AIGT0230H1 AIGT0230B/AIGT0230H AIGT0232B1/ AIGT0232H1 AIGT0232B/AIGT0232H
Display	STN monochrome LCD		
Resolution	128 (W) x 64 (H) dots		
Display color	2 colors (balck/white)		
Displayable area	70.38 (W) x 35.18 (H) mm		
LCD life	Average 50,000 hours (at 25 °C room temperature)		
Backlight	3-color LED backlight (green, red, orange)	1-color LED backlight (white)	3-color LED backlight (white, red, pink)

7.1.3 Functions

Item	GT01 specifications
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double or quadruple in height and width. Octuple in width True Type (GTWIN): 10 to 64 dots Windows(R): 10 to 64 dots
Character types	Alphanumeric characters
Number of screens	Approx. 160 screens Screen numbers that can be set: Base screens No. 0 to 3FF * Number of screens that can be registered varies depending on registered contents.
Screen types	Base screen (switchable from outside, parts attachable) Keyboard screen (screen allows direct input to data parts)
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps
Part functions	Messages, lamps, switches, data, bar graphs, keyboard, line chart
Other functions	Recipe function, Flow display, Write device function, Multi language exchange function, Copy function
Through function	PLC can be communicated with personal computer by connecting computer to TOOL port and PLC to COM port. (This function is not available for PLCs manufactured by other companies.)

Note) A clock part can be indicated by referring to external clock data. Clock function is not equipped in GT01.

7.1.4 Touch Key

Item	GT01 specifications
Touch key	Analog touch key
Touch key operation	0.5 N or less
Touch key life	Min. 10^6

Note1) The GT01 touch-switches operate using analog resistance membrane. Do not press two or more points on the screen at the same time. Doing so might operate a switch located between those points if one exists.

Note2) This touch-panel is designed to be operated by touching with fingers. The positional accuracy of the switches is based on the size of a finger.

7.1.5 Memory

Screen data and GTWIN Configuration Settings data

Item	GT01 specifications
Memory type	F-ROM
Memory chapacity	384 kbytes

7.1.6 Serial Interface

Item		GT01 specifications	
		AIGT0030B1/AIGT0030H1 AIGT0030B/AIGT0030H AIGT0130B1/AIGT0130H1 AIGT0130B/AIGT0130H	AIGT0032B1/AIGT0032H1 AIGT0032B/AIGT0032H AIGT0132B1/AIGT0132H1 AIGT0132B/AIGT0132H
COM port	Communications ratings	Conforms to RS232C (Non insulation type)	Conforms to RS422 (Non insulation type)
	Conditions for communications with external devices	Baud rate: 9600, 19200, 38400, 57600, 115200 bps Data bits: 7 or 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Transmission distance	AIGT0*30B1/AIGT0*30H1* Max. 3 m Note1) (115,200 bit/s) AIGT0*30B/AIGT0*30H* Max. 15 m (19,200 bit/s)	AIGT0*32B1/AIGT0*32H1* Max. 30 m (115,200 bit/s) AIGT0*32B/AIGT0*32H* Max. 500 m (115,200 bit/s)
	Protocol	Supports PANASONIC FP series/General-purpose serial/Mitsubishi FX, A and Q series/Omron SYSMAC-C series/Modbus (RTU) and (RUT/mocicon PLC)/Siemens S7-200 series/Toshiba Machine PROVISOR TCmini series/Yokogawa FA-M3 series/Allen-Bradly SLC5 series/LG MASTER-K (Cnet) series/Keyence KV series	
	Connector	Connector terminal base (8-pin) * Regarding power supply voltage, please pay due consideration to the cable length so that the applied voltage is within the operation voltage range. Also, when supplying power from a power supply separate from the PLC, please make sure the power cable is no longer than 10 m.	
TOOL port	Communications ratings	Conforms to RS232C (Non insulation type)	
	Conditions for communications with external devices	Baud rate: 9600, 19200, 115200, 230400 bps Note2)Note3) Data bits: 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Protocol	Dedicated protocol	
	Connector	Mini-DIN (5-pin)	

Note1) When running a 5 V type directly with the PLC power supply, please comply with the PLC restrictions. For this reason, you may not be able to use at the distances given above.

Note2) The baud rate of 230400 bps is available when the USB/RS232C conversion cable is used.

Note3) When the baud rate for the TOOl port is set to 230400 bps, the connection using the GTWIN automatic communication setting function is not possible. Set the GTWIN communication setting to 230400 bps, and then transfer data.

Reference:

For information on connecting and wiring the cables, refer to <Chapter 4 Connecting with PLCs> and <GTWIN HELP>.

7.2 GT05

7.2.1 General Specifications

Item	GT05 specifications	
	GT05M/GT05G	GT05S
Rated voltage	24 V DC	
Operating voltage range	21.6 to 26.4 V DC	
Power consumption	2.4 W or less (100 mA or less)	3.6 W or less (150 mA or less)
Insulation method of power supply part	Transformer insulation	
Ambient temperature	0 to +50 °C Note1)	
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)	
Storage temperature	-20 to +60 °C	
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)	
Breakdown voltage Note2)	Between [power supply terminals (+ and – terminals)] and [function earth terminal] 500 V AC for 1 minute, Cutoff current 10mA (at default setting)	
Insulation resistance Note2)	Between [power supply terminals (+ and – terminals)] and [function earth terminal] 100 MΩ or more, 500 V DC, measured with megohmmeter (at default setting)	
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes	
Shock resistance	98 m/s^2, 4 times on 3 axes	
EC Directive applicable standard	EMC Directive: EN61131-2	
Noise immunity	1000 V [P-P] or more, Pulse width 50 ns, 1μs between power supply terminals (based on in-house measurements)	
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.	
Weight	Approx. 230 g	

Note1) When it is installed in a horizontal orientation (installed to make the liquid cyristal face be topside), the usable range is 0 to +40 °C.

Note2) Not isolated between the USB port, COM. port and the internal digital circuit.

7.2.2 Display

Item	GT05 specifications		
	GT05M	GT05G	GT05S
Display	STN monochrome LCD		STN color LCD
Resolution	320 (W) x 240 (H) dots		
Displayable area	73.0 (W) x 55.2 (H) mm		
Backlight	LED backlight (White, rec, pink)	LED backlight (Red, green, orange)	LED backlight (White)
Backlinght brightness adjustment	Backlight brightness can be adjusted on the menu screen or GTWIN configuration settings.		
Contrast adjustment	Contrast can be adjusted on the menu screen.		

Note) Note that there are some minor variations in the backlight brightness.

7.2.3 Touch Key

Item	GT05 specifications
Touch key	Analog touch key (resistive film type) Note1)
Touch key operation	0.8 N or less
Touch key life	Min. 10^6 (at 25 °C)

Note1) Do not press two or more points on the screen at the same time. Doing so might operate a switch located between those points if one exists. The touch switch is designed to be operated by touching with fingers. Please realize that the positional accuracy of the switches is based on the size of a finger.

7.2.4 Functions

Item	GT05 specifications	
	GT05M/GT05G	GT05S
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double, quadruple or octuple in height and width True Type (GTWIN): 10 to 240 dots Windows(R): 10 to 240 dots	
Character types	Alphanumeric characters (English, Japanese, Korean, Germany, French, Italian, Spanish, Simplified Chinese, Traditional Chinese characters and Turkish can be displayed.)	
Number of screens	Approx. 240 screens Note1)	Approx. 180 screens Note1)
Screen types	Base screen (switchable from outside, parts attachable) Keyboard screen (screen allows direct input to data parts)	
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps	
Part functions	Messages, lamps, switches, data, bar graphs, keyboard, line graphs, alarm list, clock Note2) Note3) Note4)	
Other functions	Recipe function, flow display function, write device function, multi language exchange function, alarm list function	
Through function	PLC can be communicated with personal computer by connecting the computer to the USB port and Panasonic PLC to COM. port. (This function is not available for PLCs manufactured by other companies.)	
GTWIN ver.	Ver2.90 or later	

Note1) Maximum allowable number varies depending on registered contents.

Note2) External clock data can be refferred and displayed.

Note3) When backing up the built-in clock data, device hold data, or alaram history, purchase a battery (product No. AFPX-BATT).

Note4) Accuracy of the clock is ±180 seconds per month.

7.2.5 Memory

Item		GT05 specifications	
		GT05M/GT05G	GT05S
Base screen data, keyboard screen data, flow display data	Memory type	F-ROM	
	Memory capacity	2048 k bytes	12288 k bytes
Recipe data	Memory type	F-ROM	
	Memory capacity	64 k bytes	
Device writing data	Memory type	F-ROM	
	Memory capacity	64 k bytes	
Device hold area Note1)	Used memory	SRAM	
	Memory capacity	Device hold area (Max. 24 words)	

Note1) As a battery is necessary for SRAM backup, purchase a battery (product No. AFPX-BATT).

7.2.6 Communication Interface

Interface for connecting PLC and external devices
COM. port

Item	GT05 specifications	
Communication standard	For AIG05*Q*2D/AIG05*Q*3D: Conforms to RS232C ((Non insulation type) For AIG05*Q*4D/AIG05*Q*5D: Conforms to RS422 ((Non insulation type) Note1)	
Communication condition wioth external devices	Baud rate (bit/s)	9, 600, 19,200, 38, 400, 57, 600, 115, 200
	Data length (bit)	7, 8
	Parity	None, odd, even
	Stop bit (bit)	1
Transmission distance (Total length)	For AIG05*Q2D/AIG05*Q3D (RS232C) Max. 15m at baud rate 19200 bit/s	
	For AIG05*Q4D/AIG05*Q5D (RS422/RS485) Max. 500m at baud rate 115200 bit/s	
Protocol	- MEWTOCOL (Protocol for Panasonic PLC FP series) - General-purpose serial (Exclusive protocol) - Protocol for PLCs manufacutured by other companies (For details, refer to each manual.)	
Connector	Connector terminal block (8 pins) Regarding the power supply voltage, give consideration to the cable length to apply an appropriate voltage within the operating voltage range.	

Note1) It is internally isolated from the input power supply side (between +24V and 0V).

Reference: For the information on connection methods,
refer to <Chapter 4 Connecting and Communicating with the PLC>, <GTWIN HELP>.

USB port

Item	GT05 specifications
Interface standard	USB1.1
Connector shape Note1)	TYPE-B
Transmission distance	Max. 5 m
No. of connected unit with PC	1 unit

Note1) Take care of handling of the connector not to add an excessive static electricy on the metal part

7.2.7 External Memory Specifications

SD memory card slot

Item	GT32 specifications
Support media	SD memory card (32MB to 1GB) Note1)
Supported format standard	Conforms to SD standard Note2)

Note1) The manufacturer name that the operation check has done: Matsusita Electric Works, Ltd.
Note2) Do not format with the standard format software of a PC.
Note3) The SD access lamp turns on while acccessing the SD memory card.

7.3 GT11

7.3.1 General Specifications

Item	GT11 specifications
Rated voltage	24 V DC
Operating voltage range	21.6 to 26.4 V DC
Power consumption	2.4 W or less (100 mA or less)
Ambient temperature	0 to +50 °C
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)
Storage temperature	-20 to +60 °C
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes
Shock resistance	98 m/s^2, 4 times on 3 axes
Noise immunity	1000 V [P-P] or more, Pulse width 50 ns, 1μs between power supply terminals (based on in-house measurements) *When using our exclusive cable
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.
Weight	Approx. 230 g

7.3.2 Display

Item	GT11 specifications	
	AIGT2030B/AIGT2030H AIGT2032B/AIGT2032H	AIGT2130B/AIGT2130H AIGT2132B/AIGT2132H
Display	STN monochrome LCD	
Resolution	240 (W) x 96 (H) dots	
Displayable area	96.0 (W) x 35.4 (H) mm	
Backlight	3-color LED backlight (green, red, orange)	1-color LED backlight (white)
Contrast adjustment	Contrast can be adjusted on the menu screen.	

7.3.3 Functions

Item	GT11 specifications
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double or quadruple in height and width. Octuple in width True Type (GTWIN): 10 to 96 dots Windows(R): 10 to 96 dots
Character types	Alphanumeric characters (English, Japanese, Korean, Germany, French, Italian, Spanish, Simplified Chinese, Traditional Chinese characters and Turkish can be displayed using the screen creation tool GTWIN.)
Number of screens	Approx. 250 screens Screen numbers that can be set: Base screens No. 0 to 3FF * Number of screens that can be registered varies depending on registered contents.
Screen types	Base screen (switchable from outside, parts attachable) Keyboard screen (screen allows direct input to data parts)
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps
Part functions	Messages, lamps, switches, data, bar graphs, keyboard, line graphs,Clock Note1) Note2) Note3)
Other functions	Recipe functionm Flow display function, Write device function, Alarm history function Note2), Multi language exchange function, Copy function
Through function	PLC can be communicated with personal computer by connecting computer to TOOL port and PLC to COM port. (This function is not available for PLCs manufactured by other companies.)

Note1) The clock part can be indicated by referring to external clock data.
Note2) When using the built-in clock or bakcing up the alaram history, purchase a commercial battery.
Note3) Accuracy of the clock is ±100 seconds per month.

7.3.4 Touch Key

Item	GT11 specifications
Touch key	Analog touch key (resistive film type) Note1) Note2)
Touch key operation	0.5 N or less
Touch key life	Min. 10^6

Note1) The GT touch-switches operate using analog resistance membrane. Do not press two or more points on the screen at the same time. Doing so might operate a switch located between those points if one exists.
Note2) This touch-panel is designed to be operated by touching with fingers. The positional accuracy of the switches is based on the size of a finger.

7.3.5 Memory

Screen data and GTWIN Configuration Settings data

Item	GT11 specifications
Memory type	F-ROM
Memory chapacity	1.375 Mbytes

Clock data, PLC device storage data (24 words max.) and alarm history

Item	GT11 specifications
Memory	SRAM
Memory backup	Lithium battery (replaceable type) CR2032 (commercially available)

7.3.6 Serial Interface

Item		GT11 specifications	
		AIGT2030B/AIGT2030H AIGT2130B/AIGT2130H	AIGT2032B/AIGT2032H AIGT2132B/AIGT2132H
COM port	Communications ratings	Conforms to RS232C (Non insulation type)	Conforms to RS422 (Non insulation type)
	Conditions for communications with external devices	Baud rate: 9600, 19200, 38400, 57600, 115200 bps Data bits: 7 or 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Transmission distance	Max. 15 m (RS232C)	Max. 500 m (RS422)
	Protocol	Supports PANASONIC FP series/General-purpose serial/Mitsubishi FX, A and Q series/Omron SYSMAC-C series/Modbus (RTU) and (RUT/mocicon PLC)/Siemens S7-200 series/Toshiba Machine PROVISOR TCmini series/Yokogawa FA-M3 series/Allen-Bradly SLC5 series/LG MASTER-K (Cnet) series/Keyence KV series	
	Connector	Connector terminal base (8-pin) * Regarding power supply voltage, please pay due consideration to the cable length so that the applied voltage is within the operation voltage range.	
TOOL port	Communications ratings	Conforms to RS232C (Non insulation type)	
	Conditions for communications with external devices	Baud rate: 9600, 19200, 115200, 230400 bps Note1)Note2) Data bits: 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Protocol	Dedicated protocol for GT	
	Connector	Mini-DIN (5-pin)	

Note1) The baud rate of 230400 bps is available when the USB/RS232C conversion cable is used.

Note2) When the baud rate for the TOOl port is set to 230400 bps, the connection using the GTWIN automatic communication setting function is not possible. Set the GTWIN communication setting to 230400 bps, and then transfer data.

7.4 GT21

7.4.1 General Specifications

Item	GT21 specifications
Rated voltage	24 V DC
Operating voltage range	21.6 to 26.4 V DC
Power consumption	4.8 W or less (200 mA or less)
Ambient temperature	0 to +50 °C Note1)
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)
Storage temperature	-20 to +60 °C
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes
Shock resistance	98 m/s^2, 4 times on 3 axes
Noise immunity	1000 V [P-P] or more, Pulse width 50 ns, 1μs between power supply terminals (based on in-house measurements) *When using our exclusive cable
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.
Weight	Approx. 330 g

Note1) When it is installed in a horizontal orientation (installed to make the liquid cyristal face be topside) or when the FP programmer II is connected to the TOOL port, the usable range is 0 to +45 °C.

7.4.2 Display

Item	GT21 specifications AIGT2230B/AIGT2230H AIGT2232B/AIGT2232H
Display	STN color LCD
Resolution	320 (W) x 240 (H) dots
Displayable area	98.0 (W) x 74.0 (H) mm
Backlight	White LED backlight
Contrast adjustment	Contrast can be adjusted on the menu screen.

7.4.3 Functions

Item	GT21 specifications
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double, quadruple or octuple in height and width True Type (GTWIN): 10 to 240 dots Windows(R): 10 to 240 dots
Character types	Alphanumeric characters (English, Japanese, Korean, Germany, French, Italian, Spanish, Simplified Chinese, Traditional Chinese characters and Turkish can be displayed using the screen creation tool GTWIN.)
Number of screens	Approx. 250 screens Screen numbers that can be set: Base screens No. 0 to 3FF * Number of screens that can be registered varies depending on registered contents.
Screen types	Base screen (switchable from outside, parts attachable) Keyboard screen (screen allows direct input to data parts)
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps
Part functions	Messages, lamps, switches, data, bar graphs, keyboard, line graphs,Clock Note1) Note2) Note3)
Other functions	Recipe functionm Flow display function, Write device function, Alarm history function Note2), Multi language exchange function, Copy function
Through function	PLC can be communicated with personal computer by connecting computer to TOOL port and PLC to COM port. (This function is not available for PLCs manufactured by other companies.)

Note1) The clock part can be indicated by referring to external clock data.
Note2) When using the built-in clock or bakcing up the alaram history, purchase a commercial battery.
Note3) Accuracy of the clock is ±180 seconds per month.

7.4.4 Touch Key

Item	GT21 specifications
Touch key	Analog touch key (resistive film type)
Touch key operation	0.8 N or less
Touch key life	Min. 10^6

Note1) The GT touch-switches operate using analog resistance membrane. Do not press two or more points on the screen at the same time. Doing so might operate a switch located between those points if one exists.
Note2) This touch-panel is designed to be operated by touching with fingers. The positional accuracy of the switches is based on the size of a finger.

7.4.5 Memory

Screen data and GTWIN Configuration Settings data

Item	GT21 specifications
Memory type	F-ROM
Memory chapacity	6.5 Mbytes

Clock data, PLC device storage data (24 words max.) and alarm history

Item	GT21 specifications
Memory	SRAM
Memory backup	Lithium battery (replaceable type) CR2032 (commercially available)

7.4.6 Serial Interface

Item		GT21 specifications	
		AIGT2230B/AIGT2230H	AIGT2232B/AIGT2232H
COM port	Communications ratings	Conforms to RS232C (Non insulation type)	Conforms to RS422 (Non insulation type)
	Conditions for communications with external devices	Baud rate: 9600, 19200, 38400, 57600, 115200 bps Data bits: 7 or 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Transmission distance	Max. 15 m (RS232C)	Max. 500 m (RS422)
	Protocol	Supports PANASONIC FP series/General-purpose serial/Mitsubishi FX, A and Q series/Omron SYSMAC-C series/Modbus (RTU) and (RUT/mocicon PLC)/Siemens S7-200 series/Toshiba Machine PROVISOR TCmini series/Yokogawa FA-M3 series/Allen-Bradly SLC5 series/LG MASTER-K (Cnet) series/Keyence KV series	
	Connector	Connector terminal base (8-pin) * Regarding power supply voltage, please pay due consideration to the cable length so that the applied voltage is within the operation voltage range.	
TOOL port	Communications ratings	Conforms to RS232C (Non insulation type)	
	Conditions for communications with external devices	Baud rate: 9600, 19200, 115200, 230400 bps Note1)Note2) Data bits: 8 bits Parity: Non, Odd, Even Stop bit: 1 bit	
	Protocol	Dedicated protocol for GT	
	Connector	Mini-DIN (5-pin)	

Note1) The baud rate of 230400 bps is available when the USB/RS232C conversion cable is used.

Note2) When the baud rate for the TOOl port is set to 230400 bps, the connection using the GTWIN automatic communication setting function is not possible. Set the GTWIN communication setting to 230400 bps, and then transfer data.

7.5 GT30

7.5.1 General Specifications

Item	GT30 specifications
Rated voltage	24 V DC
Operating voltage range	21.6 to 26.4 V DC
Power consumption	10 W or less
Ambient temperature	0 to +50 °C (25 V DC max. if installed horizonally)
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)
Storage temperature	-20 to +60 °C
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes
Shock resistance	98 m/s^2, 4 times on 3 axes
Noise immunity	1,000 V[p-p] min., pulse width 50 ns, 1μs between power supply terminals (based on noise simulator)
Static noise resistance	5,000 V min. (panel display)
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.
Weight	Approx. 440 g

7.5.2 Display

Item	GT30 specifications	
	AIGT3100B/AIGT3100H	AIGT3300B/AIGT3300H
Display	STN monochrome LCD	STN color LCD
Resolution	320 (W) x 240 (H) dots	
Display color	2 colors (blue/white)	16 colors
Displayable area	118.18 (W) x 89.38 (H) mm	
LCD life	Average 50,000 hours (at 25 °C room temperature)	
Backlight	CFL *Average backlight service life: 50,000 hours (25 °C)	

7.5.3 Functions

Item	GT30 specifications
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double, quadruple or octuple in height and width True Type (GTWIN): 10 to 240 dots Windows(R): 10 to 240 dots
Character types	Alphanumeric characters
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps
Number of screens	Approx. 220 screens (monochrome LCD type) Approx. 160 screens (color LCD type) Screen numbers that can be set: Base screens No. 00 to 3FF * Number of screens that can be registered varies depending on registered contents.
Part functions	Messages, lamps, switches, data, bar graphs,Clock Note1), keyboard
Clock function	Clock built into main unit (can also be displayed with reference to PLC clock)
Contrast adjustment	Contrast can be adjusted using touch panel operation. (10 levels)
Automatic communication settings	Setting for communication between dedicated software and PLC set automatically by connecting cable.
Debugging functions	Through function (PLC can be debugged from personal computer by connecting computer to TOOL port and PLC to COM port.)
Screen creation	Dedicated software is used. Applicable OS: Windows® 95/ Windows® 98/ Windows® Me/ Windows® 2000/ Windows NT®/ Windows® XP

Note1) Accuracy of the clock is ±100 seconds per month.

Note2) To back up the clock data, PLC device storage data and alarm history, take off the cover at the back and remove the insulation sheet in the battery case.

7.5.4 Touch Key

Item	GT30 specifications
Touch key resolution	16 (W) x 12 (H)
Touch key operation	0.98 N or less
Touch key life	Min. 10^6

7.5.5 Memory

Screen data and GTWIN Configuration Settings data

Item	GT30 specifications	
	AIGT3100B/AIGT3100H (monochrome LCD type)	AIGT3300B/AIGT3300H (color LCD type)
Memory type	F-ROM	F-ROM
Memory chapacity	1.5 Mbytes	3.25 Mbytes

Clock data, PLC device storage data (24 words max.) and alarm history

Item	GT30 specifications
Memory	SRAM
Memory backup	Lithium battery (replaceable type) CR2032 (commercially available)

7.5.6 Serial Interface

Item		GT30 specifications
COM port	Communications ratings	Conforms to RS232C (Non insulation type)
	Conditions for communications with external devices	Baud rate: 9600, 19200, 38400, 57600, 115200 bps Data bits: 7 or 8 bits Parity: Non, Odd, Even Stop bit: 1 bit
	Protocol	Supports PANASONIC FP series/General-purpose serial/Mitsubishi FX, A and Q series/Omron SYSMAC-C series/Modbus (RTU) and (RUT/mocicon PLC)/Siemens S7-200 series/Toshiba Machine PROVISOR TCmini series/Yokogawa FA-M3 series/Allen-Bradly SLC5 series/LG MASTER-K (Cnet) series/Keyence KV series
	Connector	Connector terminal base (5-pin)
TOOL port	Communications ratings	Conforms to RS232C (Non insulation type)
	Conditions for communications with external devices	Baud rate: 9600, 19200, 115200 bps Data bits: 8 bits Parity: Non, Odd, Even Stop bit: 1 bit
	Protocol	Dedicated protocol
	Connector	Mini-DIN (5-pin)

Reference:

For information on connecting and wiring the cables, refer to <Chapter 4 Connecting with PLCs> and <GTWIN HELP>.

7.6 GT32

7.6.1 General Specifications

Item	GT32 specifications		
	GT32M	GT32T0	GT32T1
Rated voltage	24 V DC		
Operating voltage range	21.6 to 26.4 V DC		
Power consumption	10 W or less (410 mA or less)		12 W or less (500 mA or less)
Insulation method of power supply part	Transformer insulation		
Ambient temperature	0 to +50 °C Note1)		
Ambient humidity	20 to 85% RH (at 25 °C, non-condensing)		
Storage temperature	-20 to +60 °C		
Storage humidity	10 to 85% RH (at 25 °C, non-condensing)		
Breakdown voltage Note2)	Between [power supply terminals (+ and – terminals)] and [function earth terminal] 500 V AC for 1 minute, Cutoff current 10mA (at default setting)		
Insulation resistance Note2)	Between [power supply terminals (+ and – terminals)] and [function earth terminal] 100 MΩ or more, 500 V DC, measured with megohmmeter (at default setting)		
Vibration resistance	10 to 55 Hz (1-minute cycle) Amplitude: 0.75 mm, 10 min on 3 axes		
Shock resistance	98 m/s^2, 4 times on 3 axes		
EC Directive applicable standard	EMC Directive: EN61131-2		
Noise immunity	1000 V [P-P] or more, Pulse width 50 ns, 1μs between power supply terminals (based on in-house measurements)		
Protective construction	IP65 (in initial status) Dustproof and drip-proof from front panel only (packing used on panel contact surface) * When reattaching, replace waterproof packing.		
Weight	Approx. 330 g		

Note1) When it is installed in a horizontal orientation (installed to make the liquid cyristal face be topside), the usable range is 0 to +45 °C.

Note2) Not isolated between the USB port, COM port, Ethernet port (GT32T1 only) and the internal digital circuit.

7.6.2 Display

Item	GT32 specifications	
	GT32M	GT32T0/GT32T1
Display	Blue-white STN monochrome LCD	4096-color TFT color LCD
Resolution	320 (W) x 240 (H) dots	
Displayable area	113.2 (W) x 86.4 (H) mm	110.8 (W) x 83.6 (H) mm
Backlight	CFL backlight	
Backlight life	75000 hours (at 25 °C)	50000 hours (at 25 °C)
Contrast adjustment	Contrast can be adjusted on the menu screen.	None

Note) The backlight life varries depending on the usage environment such as temperature, humidity or operating voltage. Especially, if it is used at low temperatures, the life will be extremely short.

7.6.3 Touch Key

Item	GT32 specifications
Touch key	Analog touch key (resistive film type) Note1)
Touch key operation	0.8 N or less
Touch key life	Min. 10^6 (at 25 °C)

Note1) The touch-switches operate using analog resistance membrane. Do not press two or more points on the screen at the same time. Doing so might operate a switch located between those points if one exists. This touch-panel is designed to be operated by touching. Please realize that the positional accuracy of the switches is based on the size of a finger.

7.6.4 Functions

Item	GT32 specifications	
	GT32M	GT32T0/GT32T1
Displayable fonts	Fixed (GTWIN): 1/4 width (8 x 8), half width (16 x 8), full width (16 x 16) Double, quadruple or octuple in height and width True Type (GTWIN): 10 to 240 dots Windows(R): 10 to 240 dots	
Character types	Alphanumeric characters (English, Japanese, Korean, Germany, French, Italian, Spanish, Simplified Chinese, Traditional Chinese characters and Turkish can be displayed.)	
Number of screens	Approx. 240 screens Note1)	Approx. 180 screens Note1)
Screen types	Base screen (switchable from outside, parts attachable) Keyboard screen (screen allows direct input to data parts)	
Graphics	Straight lines, continuous straight lines, squares, circles, ovals, arcs, elliptic arcs, fan shapes, elliptic fan shapes, beveled squares, bitmaps	
Part functions	Messages, lamps, switches, data, bar graphs, keyboard, line graphs, alarm list, clock Note2)	
Other functions	Recipe functionm Flow display function, Write device function, Multi language exchange function, Sound output function Note3)	
Through function	PLC can be communicated with personal computer by connecting computer to the Ethernet port or USB port and PLC to COM. port. (This function is not available for PLCs manufactured by other companies.)	
	Ver2.80 or later	

Note1) Maximum allowable number varies depending on registered contents.

Note2) External clock data can be refferred and displayed. When backing up the built-in clock data, device hold data, or alaram history, purchase a battery (product No. AFPX-BATT).

Note3) The sound output function is available for GT32T1 only.

Note4) The Ethernet port is available for GT32T1 only.

7.6.5 Memory

Item		GT32 specifications	
		GT32M	GT32T0/GT32T1
Base screen data, keyboard screen data, flow display data, sound data Note1)	Memory type	F-ROM	
	Memory capacity	2048 k bytes	12288 k bytes
Recipe data	Memory type	F-ROM	
	Memory capacity	64 k bytes	
Device writing data	Memory type	F-ROM	
	Memory capacity	64 k bytes	
Device hold area Note2)	Used memory	SRAM	
	Memory capacity	Device hold area (Max. 24 words)	

Note1) Sound data is available for GT32T1 only.
Note2) As a battery is necessary for SRAM backup, purchase a battery (product No. AFPX-BATT).

7.6.6 Communication Interface

Interface for connecting PLC and external devices
COM port

Item	GT32 specifications	
Communication standard	For AIG32*Q*2D/AIG32*Q*3D: Conforms to RS232C ((Non insulation type) For AIG32*Q*4D/AIG32*Q*5D: Conforms to RS422 ((Non insulation type) Note1)	
Communication condition wioth external devices	Baud rate (bit/s)	9, 600, 19,200, 38, 400, 57, 600, 115, 200
	Data length (bit)	7, 8
	Parity	None, odd, even
	Stop bit (bit)	1
Transmission distance (Total length)	For AIG32TQ*2D/AIG32TQ*3D (RS232C) Max. 15m at baud rate 19200 bit/s	
	For AIG32TQ*4D/AIG32TQ*5D (RS422/RS485) Max. 500m at baud rate 115200 bit/s	
Protocol	- MEWTOCOL (Protocol for Panasonic PLC FP series) - General-purpose serial (Exclusive protocol) - Protocol for PLCs manufacutured by other companies (For details, refer to manuals created by other companies.)	
Connector	Connector terminal block (8 pins) Regarding the power supply voltage, give consideration to the cable length to apply an appropriate voltage within the operating voltage range.	

Note1) It is internally isolated from the input power supply side (between +24V and 0V).

Reference: For the information on connection methods,
refer to <Chapter 4 Connecting with PLCs>, <GTWIN HELP>.

USB port

Item	GT32 specifications
Interface standard	USB1.1
Connector shape Note1)	TYPE-B
Transmission distance	Max. 5 m
No. of connected unit with PC	1 unit

Note1) Take care of handling of the connector not to add an excessive static electricy on the metal part of the connector.

Note2) Screens can be transferred in one third less time via the Ethernet port. (The speed varies depending on screen contents.)

Ethernet port (GT32T1 only)

Item	GT32T1 specifications
Support standard	IEEE802.8u/100BASE-TX IEEE802.3/10BASE-T Note1)
Connector shape Note2)	Plug-in phone jack
Transmission distance	Max. 100 m
Applicable cable	UTP cable (Unshielded wire) Category 5 Note3)
Auto MDI-X	Supported
SPEED lamp	Light on: During 100BASE-TX communication Blinking: During 10BASE-TX communication
LINK/ACT lamp	Light on: When linked Blinking: During data reception.

Note1) Data processing in the main unit is carried out with the serial communication of 115.2 kbps.

Note2) Take care of handling of the connector not to add an excessive static electricy on the metal part of the connector.

Note3) Do not use a STP cable (shielded wire).

7.6.7 External Memory Specifications

SD memory card slot

Item	GT32 specifications
Support media	SD memory card (32MB to 1GB) Note1)
Supported format standard	Conforms to SD standard Note2)

Note1) The manufacturer name that the operation check has done: Matsusita Electric Works, Ltd.

Note2) Do not format with the standard format software of a PC.

Note3) The SD access lamp turns on while acccessing the SD memory card.

7.6.8 Sound Output Specifications (GT32T1 Only)

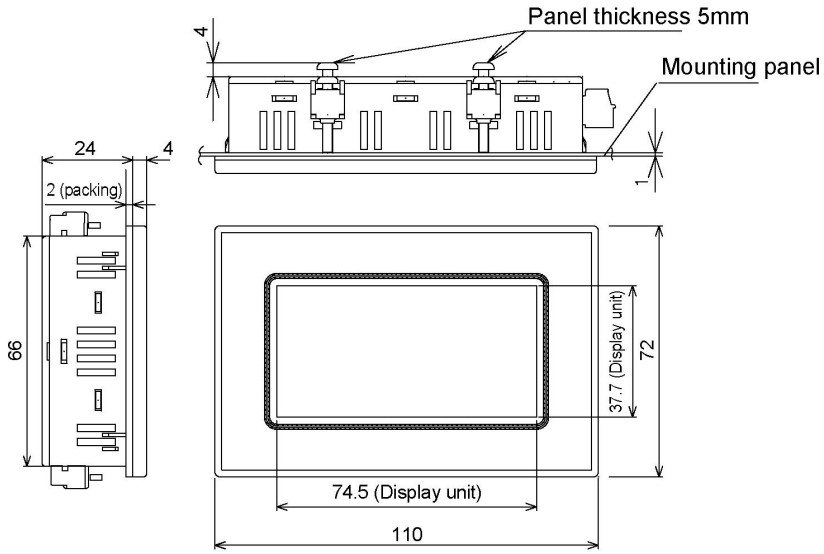
Item	GT32T1 specifications
File format	WAV format (PCM format, sampling 8 KHz, 16 bits monoral)
Max. sound data capacity	512 kbytes (Approx. 30 seconds)
Max. registered No. of sound data	128
Sound output voltage	2 Vp-p
Output terminal	ϕ3.5 stereo mini jack
Connecting amplifier	Input impedance 10 kΩ or more

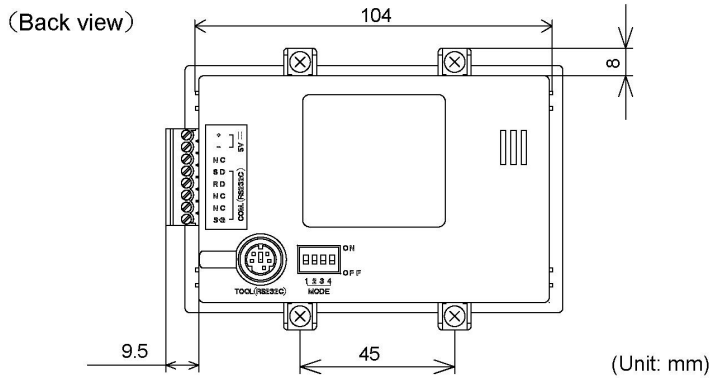
Chapter 8

Dimensions and Other Documentation

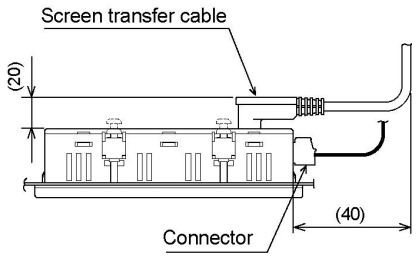
8.1 Dimensions

8.1.1 GT01/GT01R

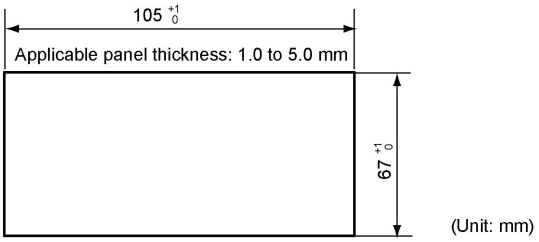




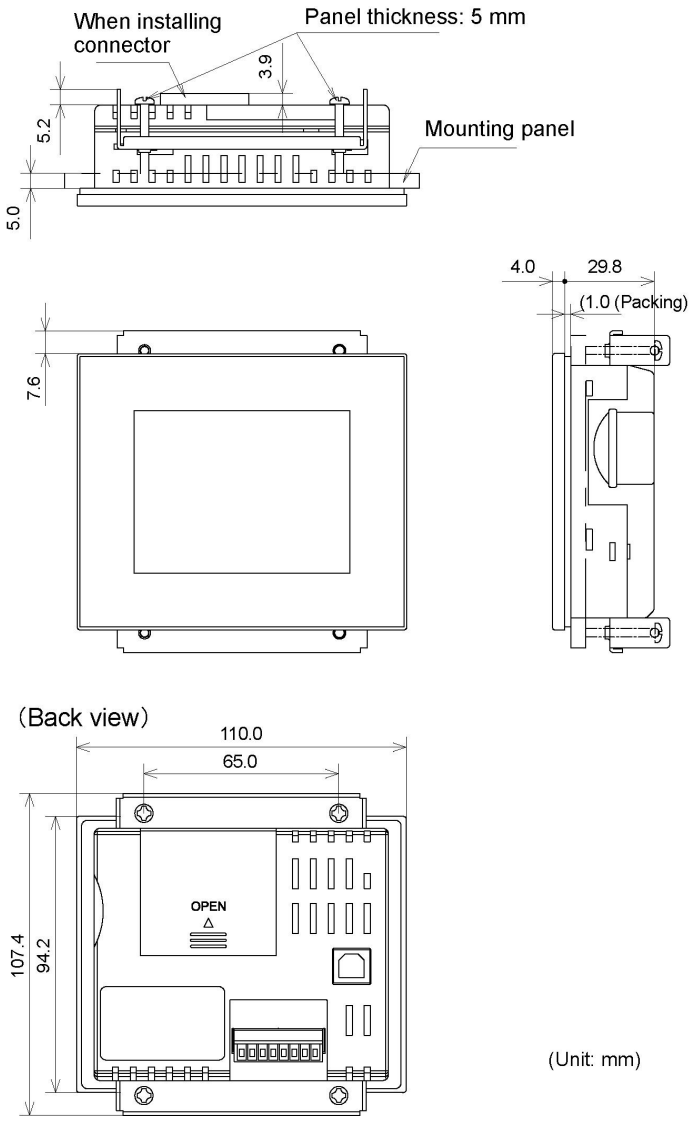
When installing cables



Panel cutout dimensions

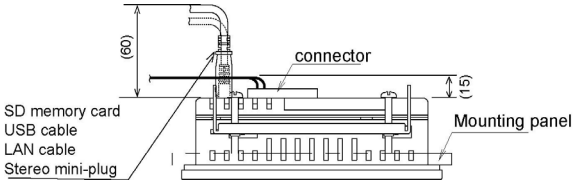


8.1.2 GT05

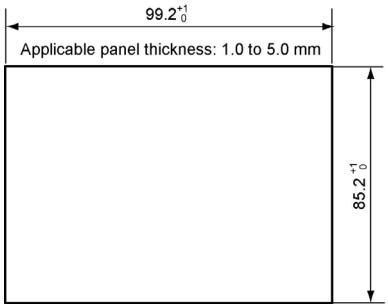


(Unit: mm)

When installing cables

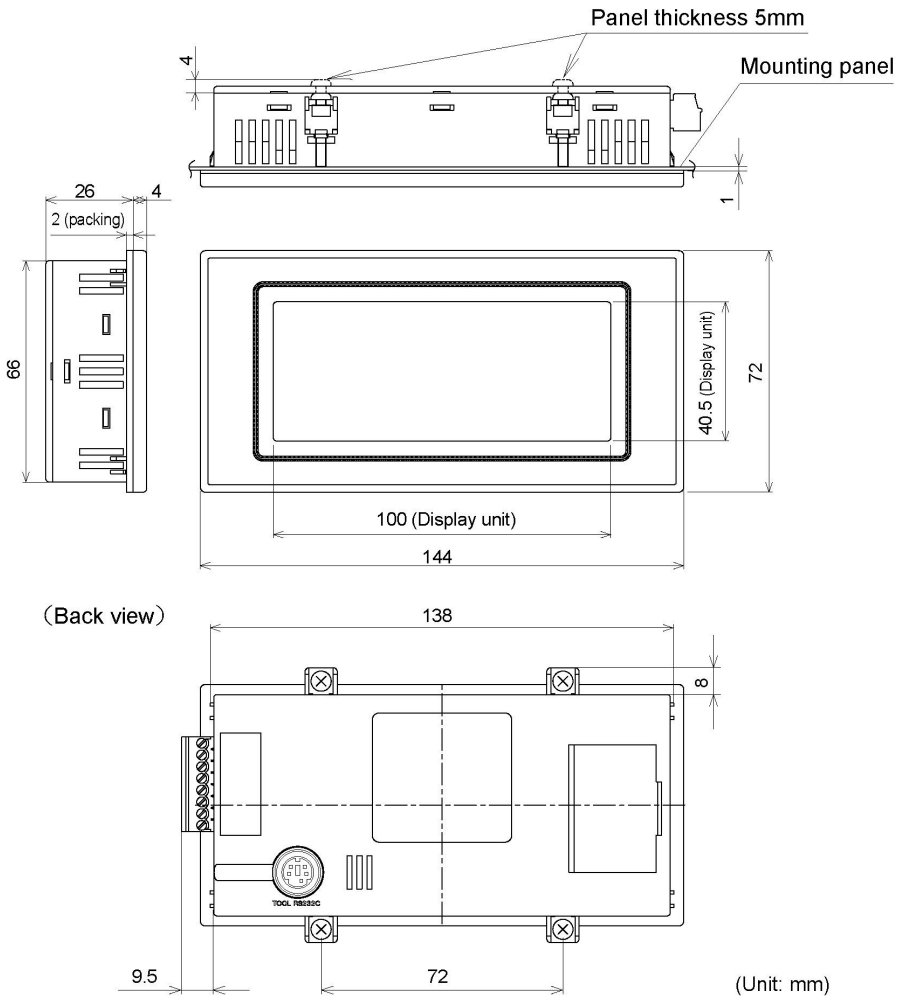


Panel cutout dimensions

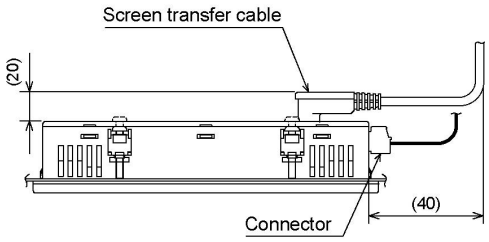


(Unit: mm)

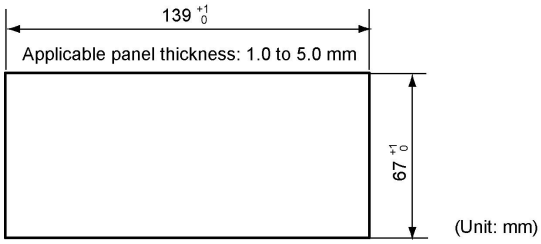
8.1.3 GT11



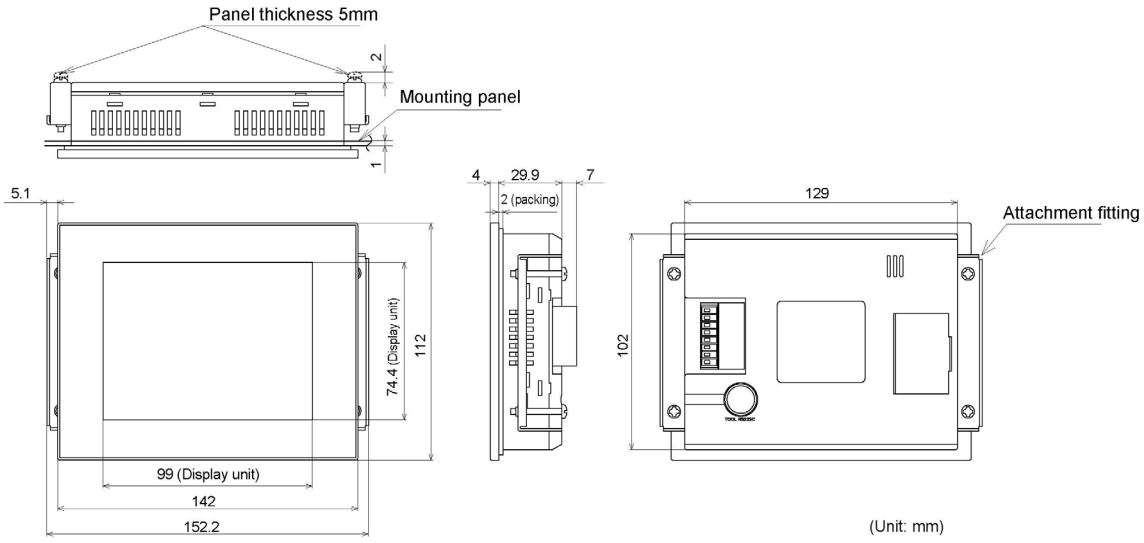
When installing cables



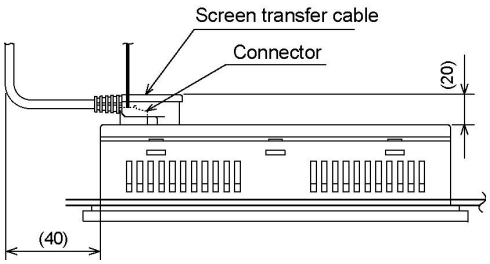
Panel cutout dimensions



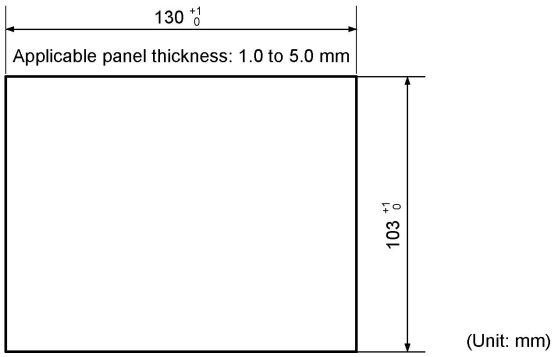
8.1.4 GT21



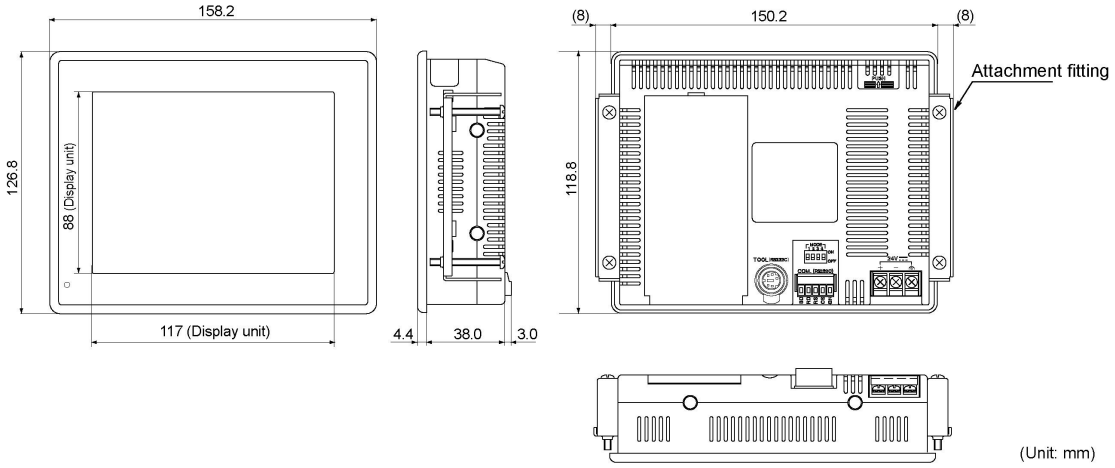
When installing cables



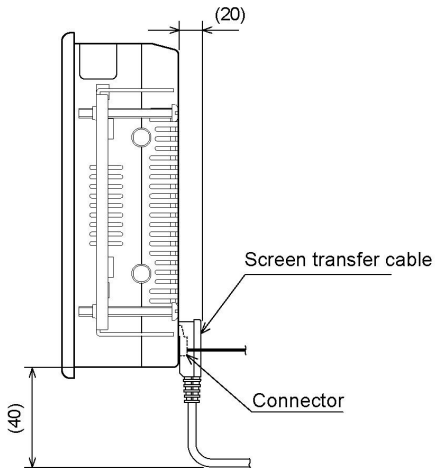
Panel cutout dimensions



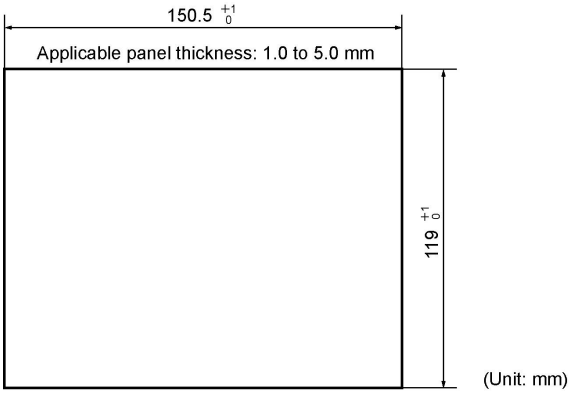
8.1.5 GT30



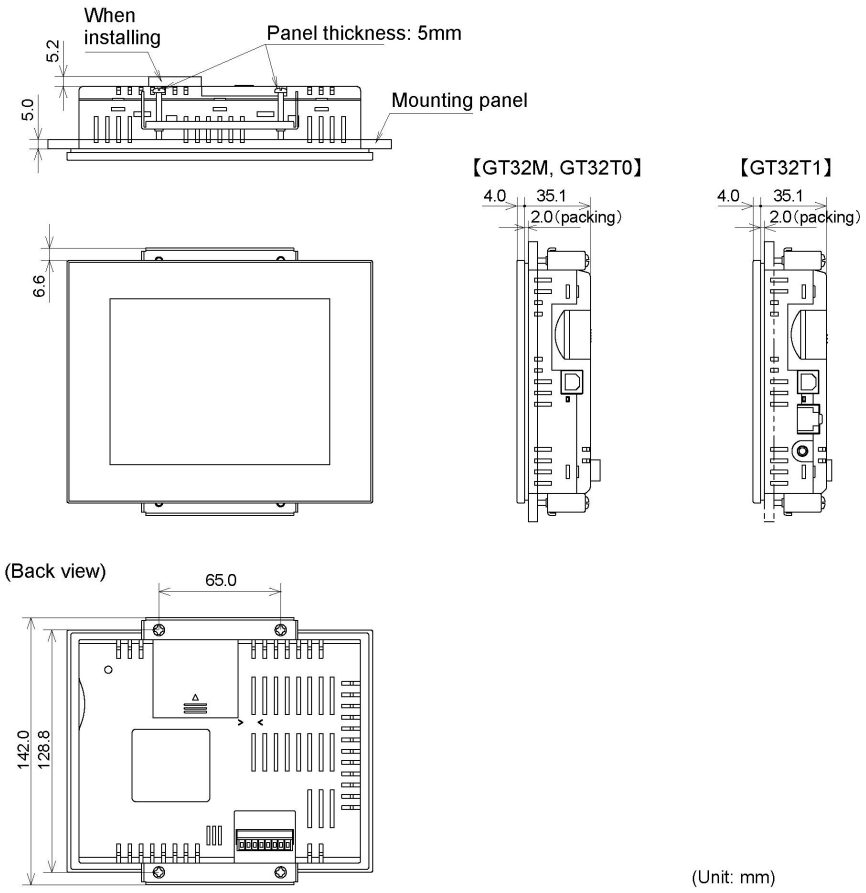
When installing cables



Panel cutout dimensions

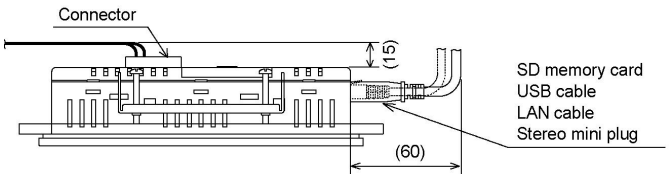


8.1.6 GT32

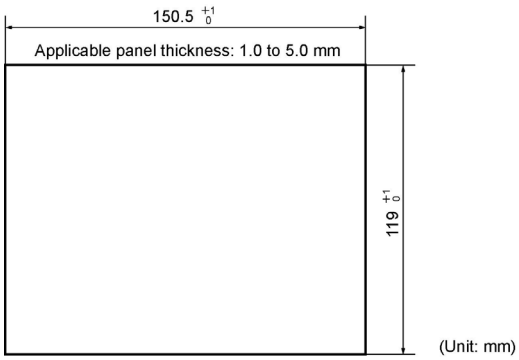


(Unit: mm)

When installing cables



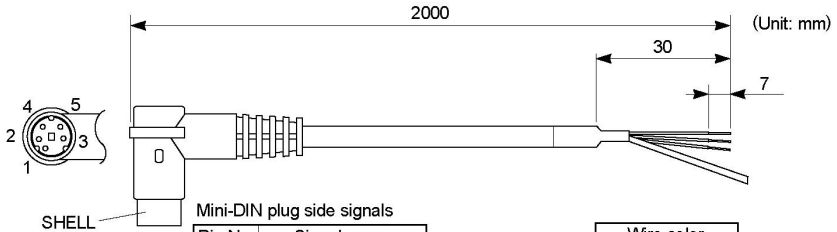
Panel cutout dimensions



(Unit: mm)

8.2 Cable Specifications

8.2.1 FP series TOOL Port Connection Cable: Mini-DIN 5-pin Loose Wire (AIGT8142)

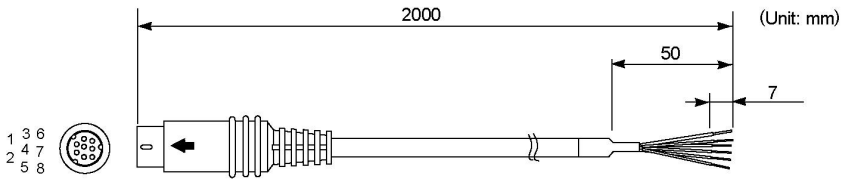


Mini-DIN plug side signals

Pin No.	Signal name	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	–	–
5	+5V	White
–	SHELL	Black

Shield

8.2.2 Mitsubishi Electric FX series TOOL Port Communication Cable (AIGT8152)

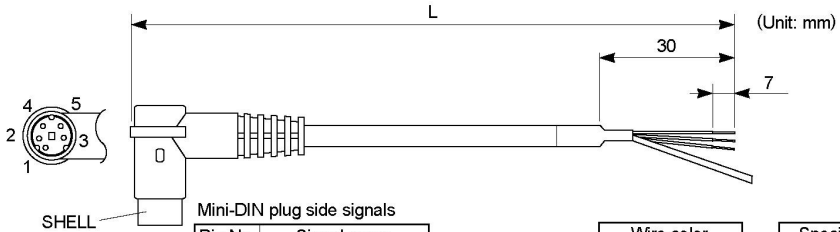


Specifications	L	Product No.
Mini-DIN 8-pin Single-side 6 loose wires	2 m	AIGT8152

Mini-DIN plug side signals

Pin No.	Signal name	Wire color
1	-RD	Green
2	+RD	Yellow
3	SG	Brown
4	-SD	Orange
5	+5V	White
6	–	–
7	+SD	Red
8	–	–
–	SHELL	–

8.2.3 PLC Communication Cable: Mini-DIN 5-pin Loose Wire (AIGT816*)



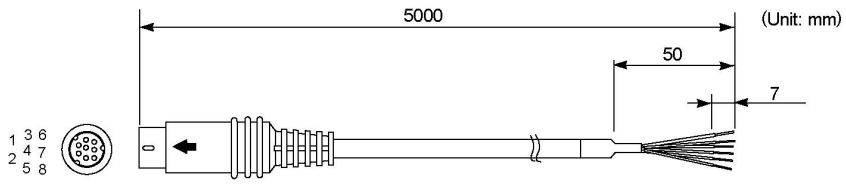
Mini-DIN plug side signals

Pin No.	Signal name	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	–	–
5	–	–
–	SHELL	Black

Shield

Specifications	L	Product No.
Mini-DIN 5-pin Single-side 4 loose wires	2 m	AIGT8162
	5 m	AIGT8165
	10 m	AIGT8160

8.2.4 PLC Communication Cable: Mini-DIN 8-pin Loose Wire (AIGT8175)

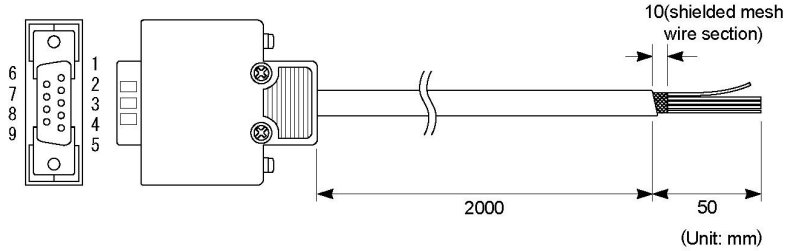


Specifications	L	Product No.
Mini-DIN 8-pin Single-side 4 loose wires	5 m	AIGT8175

Mini-DIN plug side signals

Pin No.	Signal name	Wire color
1	-RD	Green
2	+RD	Yellow
3	–	–
4	-SD	Orange
5	–	–
6	–	–
7	+SD	Red
8	–	–
–	SHELL	–

8.2.5 PLC Communication Cable: D-SUB 9-pin Loose Wire (AIP81842)

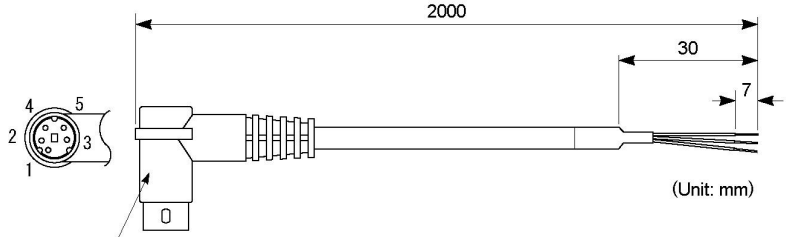


Signals on D-SUB side

Pin No.	Wire color	Dot mark
1	Brown	Black dot
2	Brown	Red dot
3	Yellow	Black dot
4	Yellow	Red dot
5	Green	Black dot
6	–	–
7	Green	Red dot
8	–	–
9	–	–

Specifications	L	Product No.
D-SUB 9-pin Single-side loose wire	2 m	AIP81842

8.2.6 PLC Communication Cable: Mini-DIN 5-pin Loose Wire (AIGT8192)



Connector
Made by JST Mfg. Co., Ltd.: MD-P15B (housing A)
MD-P16A (housing B)
MD-PS8T (shell)
MD-SP2240×5 (terminal)

Mini-DIN plug side signals

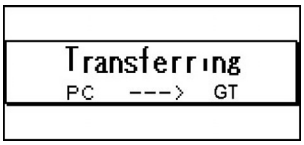
Pin No.	Signal name	Wire color
1	SG	Brown
2	SD	Red
3	RD	Orange
4	–	–
5	–	–

Specifications	L	Product No.
Mini-DIN 5-pin Single-side loose wires	2 m	AIGT8192

8.3 Table of Screen Messages

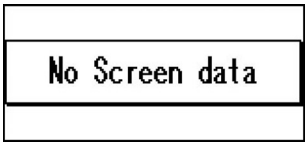
Table of GT screen messages
In addition to screen data, the GT also displays the following messages.

When transferring data from personal computer to a GT
This is displayed when data is being transferred from the computer to the GT.

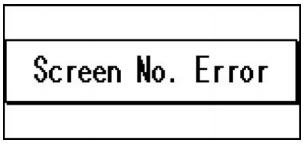


When transferring data from GT to a personal computer
This is displayed when data is being transferred from the GT to the computer.

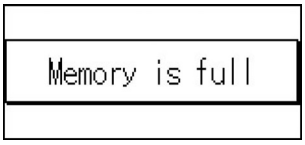
When there is no base screen data
This is displayed when there is no base screen data. (It is displayed even if the configuration data has been sent.)



When the specified screen does not exist
This is displayed in cases such as when there is no data for a specified screen number.



When the screen memory is full
This is displayed if the internal user memory (F-ROM) is full.



8.4 BIN/HEX/BCD Code Correspondence Table

Decimal	Hexadecimal	Binary		Binary Coded Decimal			
0	0000	00000000	00000000	0000	0000	0000	0000
1	0001	00000000	00000001	0000	0000	0000	0001
2	0002	00000000	00000010	0000	0000	0000	0010
3	0003	00000000	00000011	0000	0000	0000	0011
4	0004	00000000	00000100	0000	0000	0000	0100
5	0005	00000000	00000101	0000	0000	0000	0101
6	0006	00000000	00000110	0000	0000	0000	0110
7	0007	00000000	00000111	0000	0000	0000	0111
8	0008	00000000	00001000	0000	0000	0000	1000
9	0009	00000000	00001001	0000	0000	0000	1001
10	000A	00000000	00001010	0000	0000	0000	0000
11	000B	00000000	00001011	0000	0000	0001	0001
12	000C	00000000	00001100	0000	0000	0001	0010
13	000D	00000000	00001101	0000	0000	0001	0011
14	000E	00000000	00001110	0000	0000	0001	0100
15	000F	00000000	00001111	0000	0000	0001	0101
16	0010	00000000	00010000	0000	0000	0001	0110
17	0011	00000000	00010001	0000	0000	0001	0111
18	0012	00000000	00010010	0000	0000	0001	1000
19	0013	00000000	00010011	0000	0000	0001	1001
20	0014	00000000	00010100	0000	0000	0010	0000
21	0015	00000000	00010101	0000	0000	0010	0001
22	0016	00000000	00010110	0000	0000	0010	0010
23	0017	00000000	00010111	0000	0000	0010	0011
24	0018	00000000	00011000	0000	0000	0010	0100
25	0019	00000000	00011001	0000	0000	0010	0101
26	001A	00000000	00011010	0000	0000	0010	0110
27	001B	00000000	00011011	0000	0000	0010	0111
28	001C	00000000	00011100	0000	0000	0010	1000
29	001D	00000000	00011101	0000	0000	0010	1001
30	001E	00000000	00011110	0000	0000	0011	0000
31	001F	00000000	00011111	0000	0000	0011	0001
63	003F	00000000	00111111	0000	0000	0110	0011
255	00FF	00000000	11111111	0000	0010	0101	0101
9999	270F	00100111	00001111	1001	1001	1001	1001

8.5 ASCII Code Table

b7	b6	b5	b4	b3	b2	b1	b0	R \ C	0	1	2	3	4	5	6	7
				0	0	0	0	0	NUL	DEL	SPACE	0	@	P	`	p
				0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
				0	0	1	0	2	STX	DC2	"	2	B	R	b	r
				0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
				0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
				0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
				0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
				0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
				1	0	0	0	8	BS	CAN	(	8	H	X	h	x
				1	0	0	1	9	HT	EM	)	9	I	Y	i	y
				1	0	1	0	A	LF	SUB	*	:	J	Z	j	z
				1	0	1	1	B	VT	ESC	+	;	K	[	k	{
				1	1	0	0	C	FF	FS	,	<	L	¥	l	|
				1	1	0	1	D	CR	GS	-	=	M	]	m	}
				1	1	1	0	E	SO	RS	.	>	N	^	n	~
				1	1	1	1	F	SI	US	/	?	O	_	o	DEL

Record of changes

Manual No.	Date	Desceiption of changes
ARCT1F398E	Nov.2004	First edition
ARCT1F398E-1	Jun.2005	Second edition Additions: -GT01/GT11color LED Backlight Type (White) -Chapter 4 Connecting to the FP-X
ARCT1F398E-2	Dec.2005	Third edition Additions: GT21
ARCT1F398E-3	Mar.2006	Fourth edition Additions: Functions such as Copy GT, etc. (PDF only)
ARCT1F398E-4	Jan.2007	Fifth edition Additions: GT32 GT01R
ARCT1F398E-5	Nov.2007	Sixth edition Additions: GT05

These materials are printed on ECF pulp.
These materials are printed with earth-friendly vegetable-based (soybean oil) ink.

Please contact .....

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■ Facsimile: +81-6-6908-5781

http://www.mew.co.jp/ac/e/fasys/

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